

# SOUTHERN POWER AND INDUSTRY

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OCTOBER, 1954

## *In This Issue*

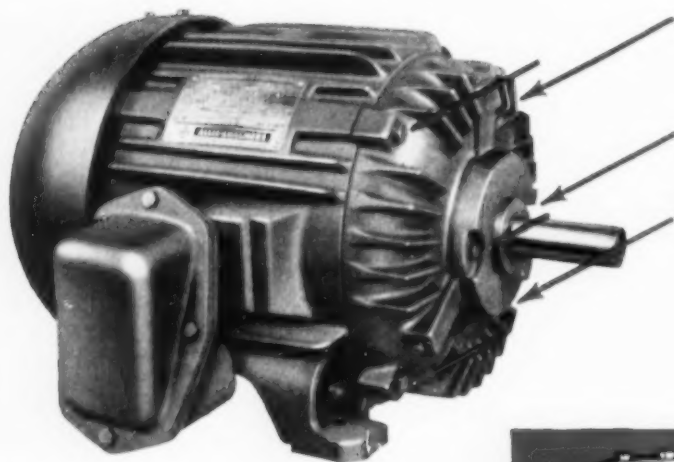
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***Seventh Annual  
Better Production  
Issue***

# Here's motor superiority you can see

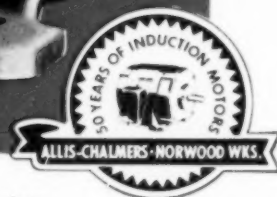
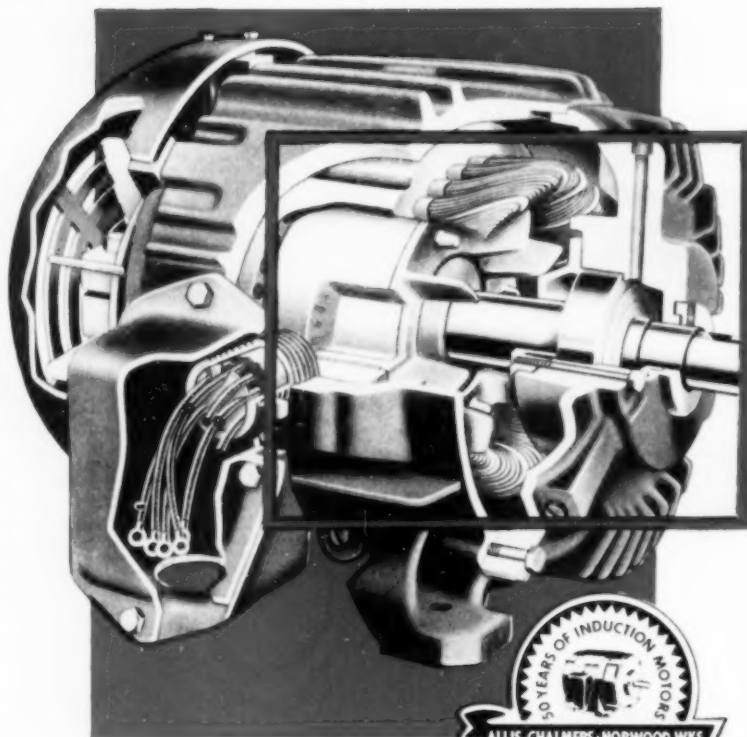


**It takes 6 bolts  
not just 4  
to give full bearing  
protection**

**T**HE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.



**Get all the facts . . . judge for yourself** — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

## ALLIS-CHALMERS



A 4441

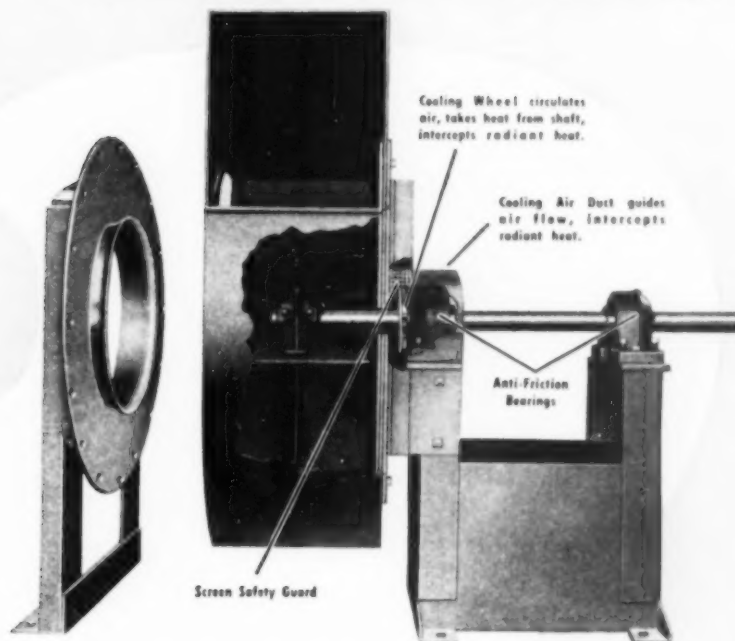
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Volume 72

Number 10



# **WANT TROUBLE-FREE** *high temperature air handling?*



New Clarage Type XL Fan shown in "opened up" view is typical of the sizes which provide universal discharge.

## **MONEY-SAVING SOLUTION:**

**Clarage's new Type XL Fans equipped with AIR Cooled Bearings!**

FOR TEMPERATURES UP TO 750° F., here's a simple, dependable, inexpensive feature available on standard Clarage fans. Costlier water cooled bearings NOT required. By all means, on your next "hot" job consult the Clarage sales engineer about this money-saving optional feature.

The new Clarage Type XL Fan — with its advanced design — offers many other important advantages in industrial air and material handling.

Learn about the high efficiency, rugged construction, and in-the-field adaptability of this exceptional fan equipment by requesting Bulletin 702. CLARAGE FAN COMPANY, Kalamazoo, Michigan.

**NOTE:** For heavier-duty service or temperatures above 750° F., this and other types of Clarage fans can be provided with water cooled bearings.

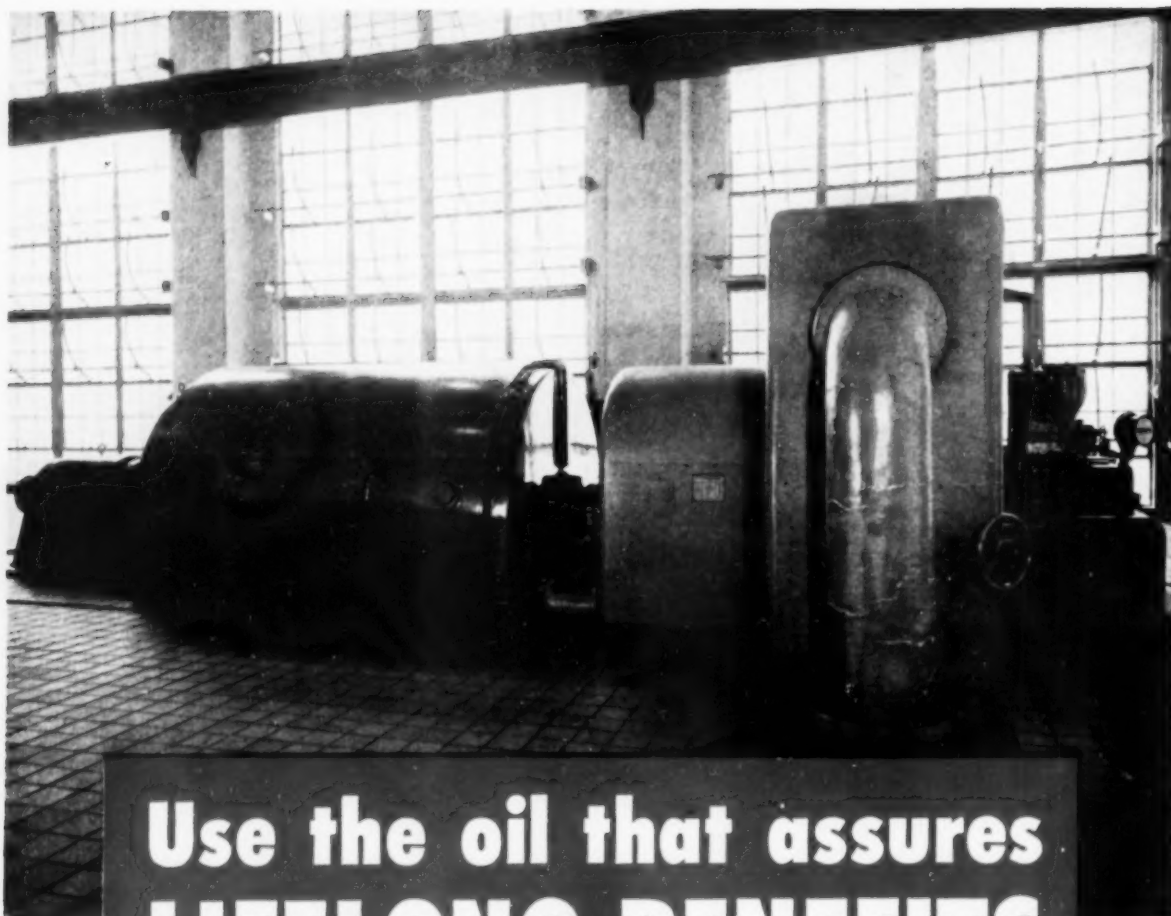
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Headquarters for  
**Air Handling and  
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New York 17, N. Y.



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**FOR ALL TURBINES**

# SOUTHERN POWER AND INDUSTRY

Vol. 72  
No. 10

OCTOBER  
1954

NBP



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Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA 5, GEORGIA

# *Facts and Trends*

## FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

October, 1954

- **NEW "HIGHS"** for efficiency, steam pressure and temperature are on the boards. Philadelphia Electric's new \$45 million station will feature the world's largest turbo-generator (275,000 kw Westinghouse unit) and a Combustion Engineering steam generator to supply steam at 5,000 psi and 1200 F. Initial operation will be at 1150 F. Expected plant heat rate for steam conditions of 5000 psi and 1150 F is 8400 Btu/kwh, some 600 Btu less than the heat rate for the most efficient existing power station.

Tandem-compound, four-cylinder turbine will operate at 3600 rpm, utilizing triple-flow exhaust to the condenser, and double reheat. Both reheats will be of 1050 F. Generator will be rated at 352,000 kva, three phase, 60 cycle, 24,000 volts, 3600 rpm. It will be self-ventilated with shaft-mounted fans and will employ hydrogen inner-cooling of rotor and stator conductors. Hydrogen pressure will be 45 psi.

- **MOST PLANT LUBRICATION** requirements can be met by well refined oils and greases. However, solid film lubricants (graphite, soaps, waxes, white lead, and molybdenum disulfide) can solve certain perplexing problems. **MOLYBDENUM DISULFIDE** is a relatively newcomer to the solid film or "Dry" lubricant field.

Three years' experience with molybdenum disulfide in the operation and maintenance departments of the B & O Railroad in Baltimore will be featured in the November issue of SP&I. Discussion will cover what moly is, why B & O was interested, specific applications in their maintenance shops, emphasis on proper use, and special applications in many industries.

- **NEW RECEIVER RECORDER** by Bailey Meter keeps continuous, independent records of one to four pneumatic and electric transmissions in any combination. Plug-in precalibrated receivers make the development possible. Fountain-type recording pens provide continuous feed for one year without refilling.

- **FOREMAN TRAINING** has a new twist at Lance, Inc., in Charlotte, N. C. Foremen and supervisors in the peanut food products plant now **SPEND SIX WEEKS IN THE PERSONNEL DEPARTMENT** observing and taking part in its functions. Each foreman learns more about handling people and is then better able to utilize effectively the manpower in his department.

Personnel staff members and foremen become better acquainted with the needs and problems of each other. Advantageous by-product is the experience gained by the foreman's assistant, who takes over during the time the foreman is training in the personnel department. The assistant, in turn, must call on another member of the department to act as his assistant, and so a chain of valuable training experience results.

(Continued on page 6)



# A MANUAL MOTOR STARTER that's Push Button Operated . . .

*and gives Accurate Overload Protection*



Maintenance man is locking stop button in OFF position before padlocking cabinet cover. All Bulletin 609 Manual Starters have this safety first feature. It protects man, motor, and machine.

Bulletin 609 Starters have a quick make, quick break, switch mechanism that is actuated manually with two push buttons. Two accurate overload breakers automatically open the switch in case of sustained overload.

The double break, silver alloy contacts require no cleaning, filing, or dressing. Bonderized pressed steel cabinets resist rust under ordinary plant conditions. For damp or dusty places the special cabinets, shown below, assure long, trouble free life. Millions of Bulletin 609's are in daily use. Write for bulletin.

Allen-Bradley Co., 1328 S. Second St., Milwaukee 4, Wis.  
In Canada — Allen-Bradley Canada Limited, Galt, Ont.

For Single and 3  
Phase Motors up  
to 5 hp, 220 v;  
7½ hp, 440-550 v.



Bulletin 609 Switch with arc hood raised to show three double break, silver alloy contacts.



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in  
Enclosures  
for Every  
Type of  
Service

## ALLEN-BRADLEY SOLENOID MOTOR CONTROL

**CONSULT YOUR LOCAL ALLEN-BRADLEY REPRESENTATIVE**

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CHARLESTON—W. J. Hess, Room 302 Morrison Bldg., 815 Quarrier St., Tel. 2-5323  
CHARLOTTE—Le Roy P. Spoon, 307 Lincoln St., Tel. 4-6334, 6-4301  
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## **facts and trends (continued from page 4)**

- **AIR-SOURCE HEAT PUMPS** electrically heat and cool Virginia Shoe Company's new 25,000 sq ft plant in Fredericksburg, Virginia. It is a one-story insulated cinder block building. Seventeen 5-ton G-E Weather-tron units with individual zone control meet widely varying heating and cooling requirements imposed by shoe manufacturing methods. Installed cooling capacity is 85 tons.

Annual cost for heating and cooling will be about \$2500, a 30% advantage over a conventional fuel-fired system. This advantage is due in part to the all-electric nature of the factory. The power load added by the heat pumps is at the most favorable rate.

- **WATER CONDITIONING GADGETS** -- Hall Laboratories, Inc., is offering reprints of a report containing observations made by its service engineers concerning numerous "cure-alls" claimed by their manufacturers to prevent scale and corrosion in industrial boilers, heat exchangers, evaporators, and water piping.

Gadgets are defined as special devices requiring substantially no technical control which are alleged to treat water by nonchemical means to prevent scale, corrosion, and other troubles encountered in the industrial use of water. Gadgets are discussed in two categories -- those with an external electrical circuit and those without such a circuit.

Eight page reprint, available free of charge, also discusses what course of action is practical for the man-in-the-plant besieged annually by a new promoter with a new gadget. For your free copy of "Practical Performance of Water-Conditioning Gadgets" write Hall Laboratories, Inc., Hagan Building, Pittsburgh 30, Penna.

- **THE POWER SUPPLY COORDINATOR** on the Southern Company Power Pool can do what no power dispatcher has ever been able to do -- push a button and get an immediate calculation of the incremental cost of delivered power from any generating source to the load centers on his system. Calculation is continuously computed on the basis of actual system conditions and encompasses all pertinent generating costs as well as transmission line losses.

Conceived by E. D. Early, manager of the Southern Company Power Pool, and built by Leeds & Northrup, the computer (popularly known as the "Early Bird") provides the power supply coordinator in Birmingham with a precise answer to what "throttle setting" will deliver power from each generating unit to the load centers at the lowest possible cost.

- **FLY ASH and BOILER SLAG** are now the basic ingredients of two types of heat-resistant top-course paving materials. Corson Co. markets the products under the patented name Poz-O-Pac.

The lime and fly ash composition was used in constructing a new apron at Lambert Field in St. Louis. Fly ash was mixed on location with ordinary lime and a small amount of water. Ground was churned up and turned until materials were evenly distributed to a depth of 10 inches. Then the ground was compacted with heavy rollers. Chemical reaction produced a rigid, freeze-and-thaw resistant, free-draining base material.

The other form of Poz-O-Pac uses boiler slag instead of earth. The same chemical reaction occurs, and the resulting pavement is like volcanic lava. Installation and materials for the Poz-O-Pac construction products are reported about 35% less than conventional paving.

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Write the editors for additional information on any of the above items.  
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

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# KERRIGAN *Weldforged* TRADEMARK

## Steel Flooring and Stair Treads

★ *For Every Industry* ★



NOTE: Continuous spiral cross bars alternate right and left and are slightly raised above bearing bars.

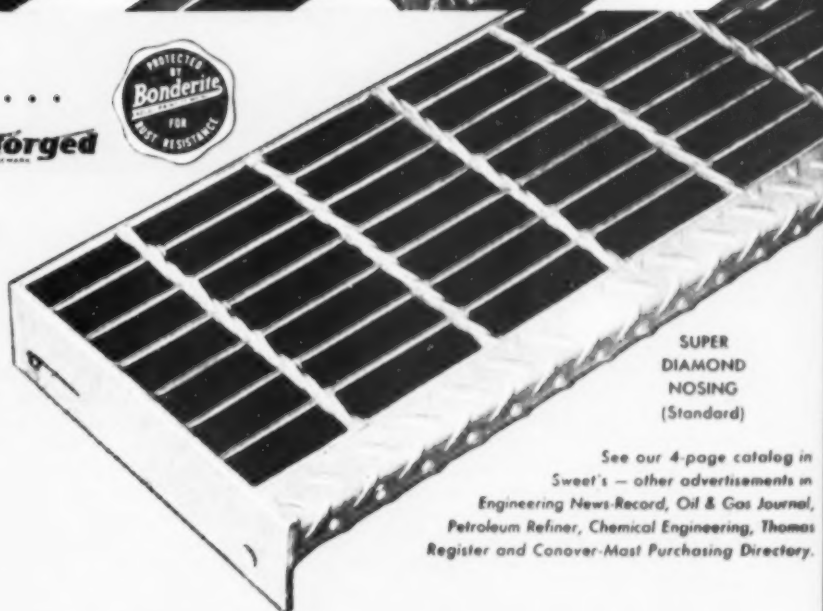
for extra non-slip safety. No slick spots.

Custom Made for YOUR job . . .  
and SAFE because it's **Weldforged**



Let our FREE illustrated catalog tell you all about it. See for yourself why Kerrigan grating is safer, how it is Weldforged into a one-piece, inseparable unit. See how Bonderite gives Kerrigan Grating extra protection and longer life.

See how Kerrigan grating is custom-fabricated to your exact requirements . . . how our large drafting staff prepares drawings (subject to your approval) and how the finished grating comes to you well marked and identified for easy, low-cost installation.



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(Standard)

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# NEWS for the South and Southwest

## Mechanical Handling—Ga.

MECHANICAL HANDLING SYSTEMS, INC., Detroit manufacturers of conveyors and materials handling equipment, announce the opening of an office at 104 Fairview Building, 403 West Place de Leon Avenue, DECATUR, GEORGIA, to serve the Southeastern States.

JOHN W. LAY, JR., a native of Atlanta, is in charge of the office. Mr. Lay is a graduate of Georgia Tech, in Industrial Engineering. He joined the company in 1950 and spent three and a half years in the Detroit office in engineering and sales work before his assignment to the new office.

## Cleaver-Brooks—Baltimore

The CLEAVER-BROOKS COMPANY announces the appointment of the HAROLD R. WHITE COMPANY, BALTIMORE, MARYLAND, as manufacturer's representative for the sale of Cleaver-Brooks boiler equipment.

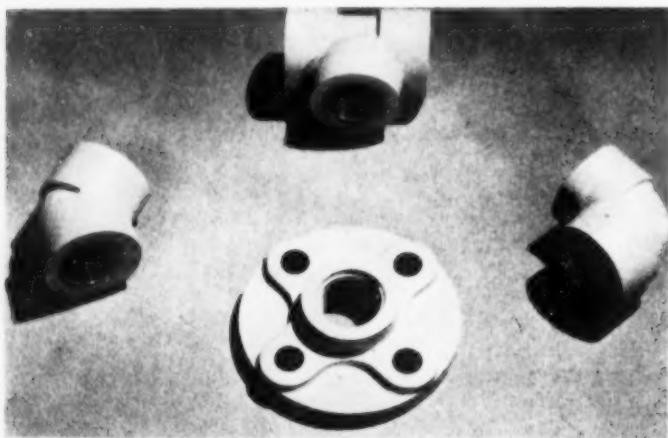
Located at 3600—4th Street, Arundel Federal Building, Baltimore, Maryland, its territory will include Washington, D. C., western Maryland, northern Virginia and the counties of Berkeley, Jefferson and Morgan in West Virginia.

Cleaver-Brooks Company manufactures equipment for the generation and utilization of heat. Among its

products are oil, gas and combination gas/oil fired stationary boilers, mobile steam boilers, thermo-compressors, evaporators, distillation equipment and industrial gas and oil burners.

## Bovay of Houston Expands

H. E. BOVAY, JR., consulting engineers, with headquarters in the Es-person Building, HOUSTON, TEXAS, recently announced the opening of a Northwest Office in Spokane, Washington. Mr. William N. Pauley, registered professional engineer, is in charge.



**Tube Turns Plastics, Inc., in Louisville  
To Produce Unplasticized PVC Pipe Fittings**

A new patented process of injection molding of unplasticized polyvinyl chloride will be used exclusively by a company recently organized, TUBE TURNS PLASTICS, INC., in the manufacture of industrial plastic pipe fittings and custom molded products. The new company, capitalized at \$1,500,000, will serve the oil, paper, chemical, food and allied industries.

The new process and equipment owned by the new company will permit the use of difficult-to-mold PVC and similar plastic materials in the fabrication of products that cannot otherwise be manufactured economi-

cally on a commercial scale, said officials of the new company.

Tube Turns Plastics, which will be located in LOUISVILLE, KY., was established jointly by Tube Turns Division of National Cylinder Gas Company and Jackson & Church Company. Formation of the new company was announced by George O. Boomer, president of Tube Turns, Louisville, and Clifford W. Stuart, president of Jackson & Church, Saginaw, Mich.

Tube Turns Plastics is presently the only source of injection molded PVC fittings as a result of the acquisition from Jackson & Church of the

TYPICAL unplasticized PVC fittings—45° and 90° elbows, a tee and a flange are injection molded by Tube Turns Plastics.

first injection molding machine and techniques for manufacture of these fittings on a commercial scale.

Many outstanding advantages are cited for piping systems fabricated of PVC. They offer exceptional resistance to a wide range of acids and alkalies, and in many instances have proved more serviceable than high grade steel and alloys. They possess high burst strength and can be furnished in a high impact strength grade. In addition, they are light in weight, unaffected by weather and can be installed easily and economically.

Tube Turns Plastics will also make fittings and custom molded products from other thermoplastics, and from thermosetting plastics.

DAVID L. PERROT, chairman of the board and executive committee of Jackson & Church, was elected board chairman of the new company. GEORGE O. BOOMER, chairman of the executive committee of National Cylinder Gas, was elected president. He also is president of The Girdler Company, another National Cylinder Gas Division. CARL McLAUGHLIN, formerly assistant to the executive vice president of Tube Turns, was elected executive vice president.

(Continued on next page)



# NICHOLSON TRAPS

Can Help You Solve  
Any Drainage Problem

## 32-Page Reference Describes Advanced-Type Trapping Methods for Process Industries

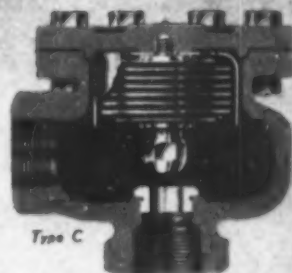
Nicholson furnishes a type and model of trap for every industrial process, power and heat application. For complete details you are invited to send for the helpful 32-page reference pictured above.

### NICHOLSON THERMOSTATIC BELLOWS STEAM TRAPS

Nicholson thermostatic bellows steam traps (at right), distinguished for their fast positive action, are suited for critical processing applications. They are widely specified for continuous production and where advanced-type quality controls are in use, due to the high even temperatures Nicholson units effect and their minimum maintenance time and costs. Other advantages: above-average drainage capacity; will not freeze in operation. Specify the trap in the proper size to fit piping requirements: in 0 to 200 lb. range use type A, D, AU or AHV; to 250 lbs., use type B or C in semi-steel construction; to 300 lbs., use type C in cast steel construction. Bellows of bronze, monel or stainless.



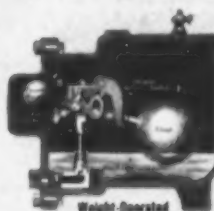
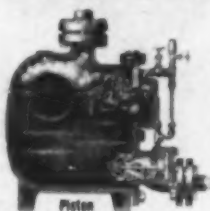
A type for every Process, Heat and Power need. For pressures from 0 to 300 lbs.



### PISTON OR WEIGHT-OPERATED TRAPS

Nicholson piston-operated steam traps (right) have large capacity and are recommended wherever water is in volume; e.g., steam purifiers. Pressures: 2 to 650 lbs. Capacities: 12,500 to 552,000 lbs. Sizes: 1 1/4" to 2 1/2".

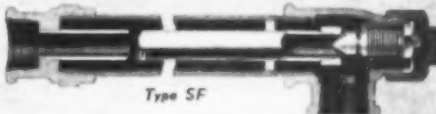
Nicholson weight-operated traps are heavy-duty types for draining steam, air and gasoline from separators, process vessels, dry kilns, accumulators, intercoolers, etc. Pressures: 23 ranges, 0 to 1500 lbs. Capacities: 1295 to 11,700 lbs. Sizes: 1/2" to 2"



### THERMOSTATIC METAL EXPANSION STEAM TRAPS

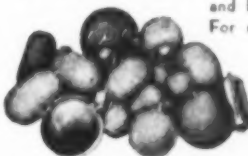
Nicholson expansion steam traps (right) require extremely low maintenance. Because they are readily adjusted to pass condensate at any point below 212°F, processing and refining plants have adopted these traps as low-cost temperature regulators on storage tanks which must be maintained at certain temperatures. Freeze-proof. Pressures: 0 to 250 lbs. Sizes: eight, 1/4" to 2".

**RADIATOR TRAPS** -- Thermostatic bellows type for vapor and vacuum heating systems under 25 psi.



### NICHOLSON WELDED FLOATS

Standard with hundreds of manufacturers. Light and heavy-duty types. For mechanisms or as vessels; 2" to 14" diam. In stainless, monel or plated steel.



**W. H. NICHOLSON & CO.**

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Sales and Engineering Offices in 38 Principal Cities

SOUTHERN POWER & INDUSTRY for OCTOBER, 1954

## News for the South and Southwest (continued)

### A. P. Green—Va., La.

THE A. P. GREEN FIRE BRICK COMPANY has announced the recent appointment of CHARLES W. GLUNK as District Sales Manager of its RICHMOND, VIRGINIA, Sales Office. Bill Glunk, graduate chemical engineer of Purdue University, was formerly a Sales Engineering Supervisor at the Green Company's home office in Mexico, Missouri.

Another new appointment is that of DICK OLSON to District Sales Manager of the new BATON ROUGE, LOUISIANA, Sales Office. Dick is a graduate of Carnegie Tech, and has many years of experience.

### Permutit — St. Louis

The Industrial Sales Department of THE PERMUTIT COMPANY, manufacturers of ion exchange resins and water conditioning apparatus, has announced the appointment of ROBERT FAY O'CONNELL as Sales Engineer of its ST. LOUIS, Mo. office.

Prior to joining Permutit, Mr. O'Connell spent seven years with the Phelan Faust Paint Mfg. Co., St. Louis, Mo., as plant engineer and development chemist and two years with the Firestone Tire & Rubber Co., Akron, Ohio, as chief analytical chemist.

He attended Washington Univer-

sity, St. Louis, Mo., receiving a Bachelor's degree in Chemical Engineering in 1941, and is a member of the U. S. Naval Reserve and the American Chemical Society.

## FUTURE EVENTS Of Engineering Interest

**PETROLEUM ELECTRIC POWER ASSOCIATION**, W. L. Pearson, Sec'y, P. O. Box 1261, Amarillo, Texas.  
**Oct. 4-6**, Twenty-Sixth Anniversary Meeting, Jung Hotel, New Orleans, La.

**SOUTHERN TEXTILE EXPOSITION**, Miss Bertha Green, Sec'y, Textile Hall Corp., Greenville, S. C.  
**Oct. 4-8**, Eighteenth Southern Textile Exposition, Textile Hall, Greenville, S. C.

**AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS**, H. H. Henline, Sec'y, 33 West 39th St., New York 18, N. Y.  
**Oct. 11-15**, Fall General Meeting, Morrison Hotel, Chicago, Ill.

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS**, C. E. Davison, Sec'y, 29 West 39th St., New York, N. Y.  
**Oct. 28-29**, ASME-AIME Joint Fuels Conference, William Penn Hotel, Pittsburgh, Pa.  
**Nov. 28-Dec. 3**, Annual Meeting, Statler Hotel, New York, N. Y.

**NATIONAL GASOLINE ASSOCIATION OF AMERICA**, Wm. F. Lowe, Sec'y-Treas., 422 Kennedy Bldg., Tulsa 3, Okla.  
**Oct. 29**, Southern Regional Meeting, Blackstone Hotel, Tyler, Texas.  
**Dec. 3**, Panhandle-Plains Regional Meeting, Herring Hotel, Amarillo, Texas.  
**Feb. 25, 1955**, Permian Basin Regional Meeting, Scharbauer Hotel, Midland, Texas.  
**Apr. 13-15, 1955**, Thirty-Fourth Annual Convention, Baker and Adolphus Hotels, Dallas, Texas.

**AMERICAN SOCIETY FOR METALS**, W. H. Eisenman, Sec'y, 7301 Euclid Ave., Cleveland 3, Ohio.  
**Nov. 1-5**, National Metal Congress and Exposition, International Amphitheater, Chicago, Ill.

**AUTOMATIC CONTROL EQUIPMENT SHOW**, Strauss, Spigler & Kline, Mer Philadelphia, Pa.  
**Nov. 21-22**, First Automation Show, Waldorf-Astoria Hotel, New York, N. Y.

**1954 NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING**, E. K. Stevens, Mgr., International Exposition Co., 480 Lexington Ave., New York 17, N. Y.  
**Dec. 2-7**, Power Show, Commercial Museum, Philadelphia, Pa.

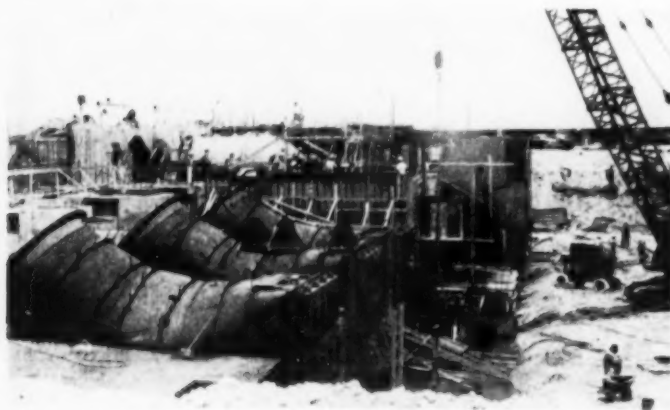
**HEATING AND VENTILATING EXPOSITION**, E. K. Stevens, Mgr., International Exposition Co., 480 Lexington Ave., New York, N. Y.  
**Jan. 24-28, 1955**, 12th International Heating & Ventilating Exposition, Commercial Museum and Convention Hall, Philadelphia, Pa.

**NATIONAL ASSOCIATION OF PURCHASING AGENTS**, Fred D. Bradley, Chm. Public Utility Buyers' Group, Southern Union Gas Co., Burt Bldg., Dallas 1, Texas.  
**Feb. 13-15, 1955**, 24th Annual Mid-Winter Conference, Shamrock Hotel, Houston, Texas.

**SOUTHERN SAFETY CONFERENCE, INC.**, W. L. Groth, Exec. Dir., P. O. Box 8827, Richmond 25, Va.  
**Feb. 27-Mar. 1, 1955**, 16th Annual Conference and Exposition, Jung Hotel, New Orleans, La.

**INDUSTRIAL MARKETING ASSOCIATES, INC.**, John Paul Taylor, Exec. Sec'y, 529 Pleasant St., St. Joseph, Mich.  
**May 22-26, 1955**, Annual Meeting, The Cloister, Sea Island, Georgia.

(More News—page 166)



## Florida Everglades Flood Control Project

The first unit of many large capacity, low lift pumps to be used in the Central and Southern Florida Flood Control Project of the Corps of Engineers has been installed in a pump station on West Palm Beach Canal about midway between Lake Okeechobee and West Palm Beach.

These huge horizontal units are the largest pumps ever produced by FAIRBANKS, MORSE & Co. Their delivery marks the culmination of six years of planning, design, model studies and construction by both Fairbanks, Morse and The Corps of Engineers. Each pump has an elliptical shaped suction intake measuring 12 by 18 ft along each axis. With driving unit and appurtenances they weigh more than 60 tons each and have a rated capacity of 360,000 gpm per pump against an average static head of 11.3 ft.

Power to operate each cast bronze

propellor, which alone is 106" in diameter and weighs 13,400 lb will be supplied by a Fairbanks, Morse 10 cylinder, 1600 hp, Model 38D-81/8 two cycle opposed piston diesel engine. A two-stage chain drive connects the engine to the pump drive shaft.

Diesel Power is employed since one of the most critical times for continuous pump operation will be when hurricanes and the heavy rains that accompany them sweep the area. During these times above ground power lines may be disrupted and stop the operation of electrically driven pumps.

Pump station 5A, now under construction, will contain six such pumps with a maximum combined discharge of 2,116,000 gallons per minute, and is only one of seven stations included in the first phase of the Central and Southern Florida Project.

# NOW

you can operate small  
valves economically & safely  
with *LimiTorque*® REMOTE CONTROL

The new SMA-00 and SMA-000 LimiTorque Valve Control is the latest and most advanced method of operating small valves, ranging from 1½" up to 8" in diameter. These units provide complete safety to workmen, by eliminating the need of climbing to high or hazardous locations for manual valve operation. The valve operating parts are protected by two limit switches ... One provides uniform valve seating thrust, giving positive protection to the parts from overload. The second switch is the geared limit, which controls the stem travel for both directions.

SMA-00 and SMA-000 LimiTorque Valve Controls offer an extremely economical, and simple method of motorizing smaller valves. These Operators can be readily applied to all types of Valves: Gate, Globe, Plug and Butterfly ... and may be had to actuate by a wide range of power sources including Electricity, Hydraulic Pressure, Natural Gas or Air.



For full details and information regarding these new LimiTorque Valve Controls, write for latest Bulletin.

SERVING SOUTHERN INDUSTRY from LYNCHBURG, VA.  
For catalogs or detailed information, write Virginia Gear and Machinery Corp., Lynchburg, Va., or the address below.

## PHILADELPHIA GEAR WORKS, INC.

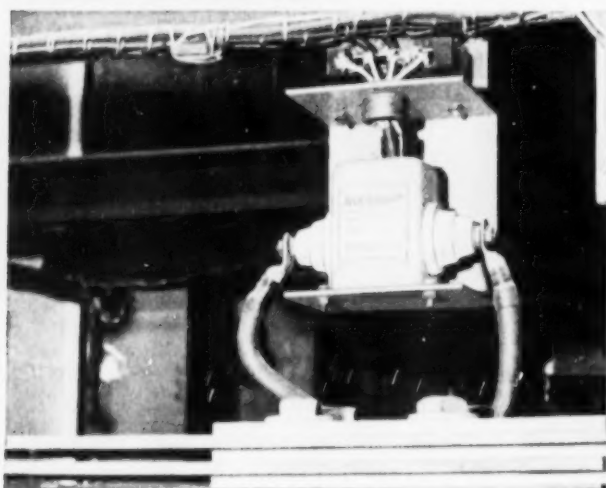
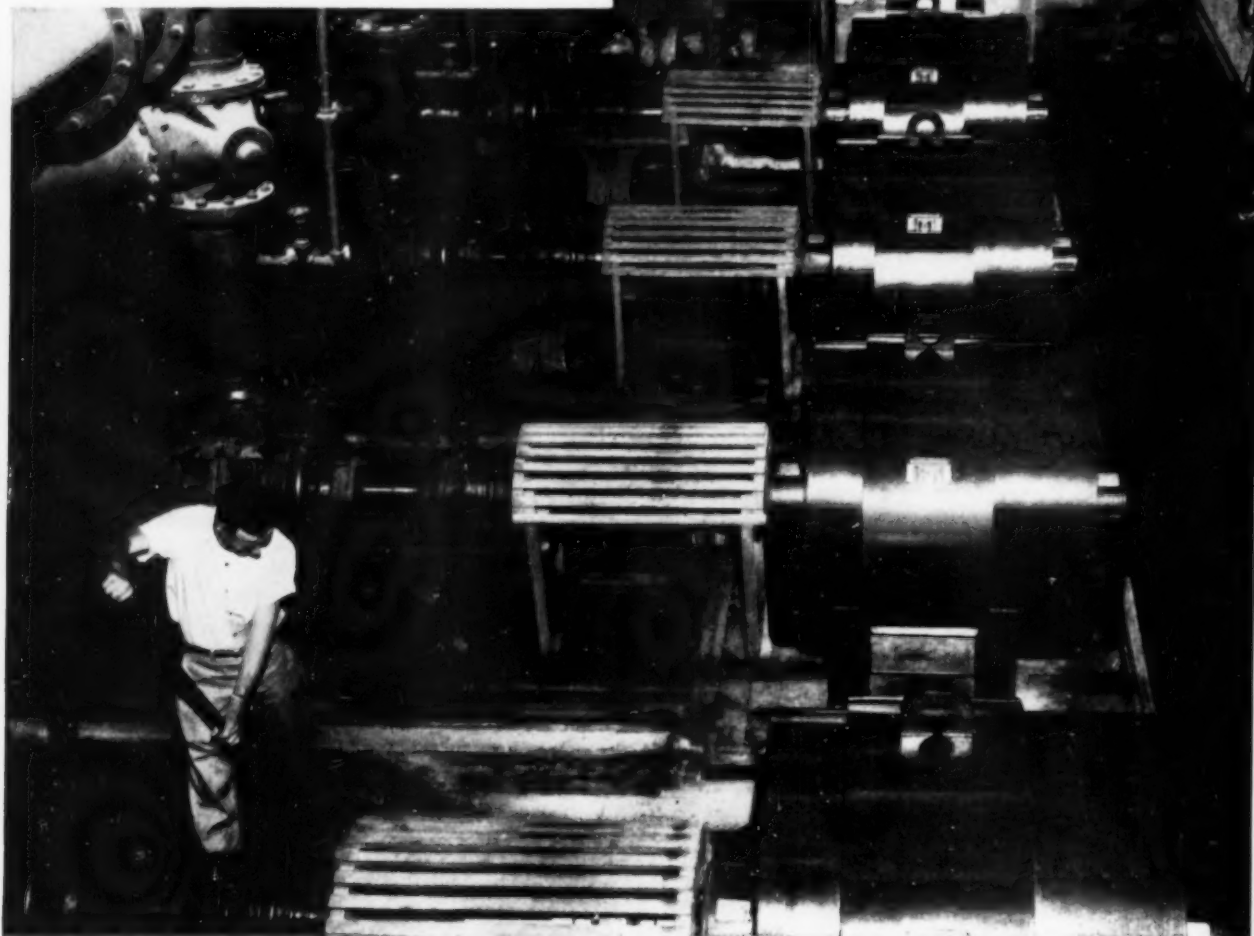
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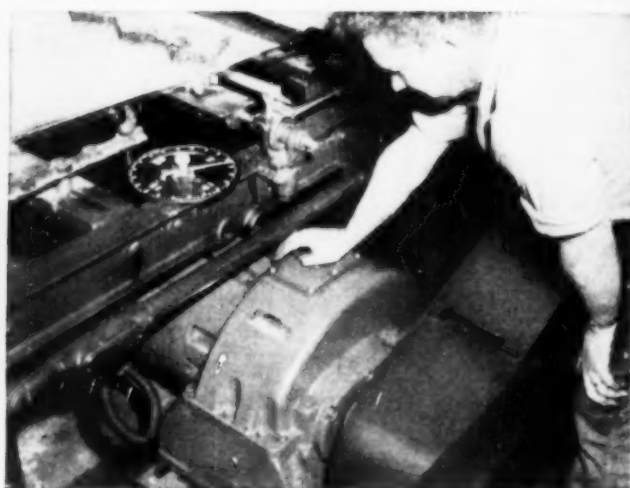
Industrial Gears & Speed Reducers

LimiTorque Valve Controls

11 Westinghouse Synchronous Motors drive these Jordan machines at Hudson Pulp and Paper Co., Palatka, Florida. They provide constant speed needed for uniform fibrillation.



Now Westinghouse Magamp provides a dependable check on a chlorine process line in a chemical plant. Whether used for control of tension, voltage, current or speed, Magamp acts swiftly, accurately. There are no moving parts to wear, no tubes to burn out.



Life-Line® Gearmotors drive a delivery roll on a slasher at this textile mill. In addition to basic efficiency, Life-Line compactness saves space and maintenance. The gear case is horizontally split for ready accessibility without disturbing oil or unit mounting.



# How Westinghouse products and services help power Southern industry

More and more is being produced in bigger and bigger plants. As the South's great industries grow, need for the *efficient* use of electric power increases with them.

Westinghouse has been able to offer a real measure of assistance in providing power components in the right combinations—for generation, distribution, utilization systems—helping not only to produce products physically, but to do it efficiently.

What is efficient power? It's produced with selected equipment that gets the right horse-

power or voltage where and when it's needed, according to demand cycle and other operating characteristics. At Hudson Pulp and Paper Co., Palatka, Fla., for example, is a proved record of boosted production with Westinghouse drives.

Your Westinghouse representative can assist you with any electrical problem in such industries as chemical, textile, paper or food processing. Working with him is a team of industry engineers, product engineers, research engineers. Or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-96027

YOU CAN BE SURE...IF IT'S  
**Westinghouse**



**Westinghouse Renewal Parts Warehouses** in your area help you keep low parts inventories on hand. Check the list at right for the service facilities nearest you.

## Westinghouse is organized to serve the South

**10 Apparatus Repair Shops** in Atlanta, Baltimore, Baton Rouge, Birmingham, Charlotte, Dallas, El Paso, Fort Worth, Houston, Huntington.

**13 Engineering Service Offices** in Atlanta, Baltimore, Beaumont, Charlotte, Dallas, El Paso, Houston, Huntington, Louisville, Memphis, New Orleans, Norfolk, Richmond.

**8 Renewal Parts Warehouses** in Atlanta, Charlotte, Dallas, El Paso, Fairmont, Houston, Huntington, New Orleans.

*Proven*

On loads *UNDER* 600 Amps . . . .

## **Fusetron dual-element Fuses** **Have an Interrupting Rating** **in Excess of 100,000 Amps.**

An interrupting rating in excess of 100,000 amperes for FUSETRON dual-element fuses . . . this was shown by tests that were conducted under conditions that simulated the most severe field conditions. These tests were witnessed and verified by the Electrical Testing Laboratories of New York.

The test circuits were set to deliver far in excess of 100,000 amperes — yet the 250 and 600 volt FUSETRON fuses cleared the shorts without igniting readily flammable material placed around the fuses . . . and there was comparatively little noise.

These tests show that Fusetron fuses, even in the small 30 ampere range, can interrupt safely the most severe available short circuit current.

### **No interference with time-lag**

Time-lag is of utmost importance to give proper motor and electrical protection and to eliminate needless blowing of fuses. Even

though the interrupting capacity has been greatly increased, the time-current characteristic of Fusetron fuses has in no way been disturbed.

### **ALL THIS ADDED SAFETY**

without changing a panelboard or switch . . . plus 10 point Protection of FUSETRON dual-element FUSES!

1. Protect against short-circuits. 2. Protect against needless blows caused by harmless overloads. 3. Protect against needless blows caused by excessive heating — lesser resistance results in much cooler operation. 4. Provide thermal protection — for panels and switches against damage from heating due to poor contact. 5. Protect motors against burnout from overloading. 6. Protect motors against burnout due to single phasing. 7. Give double burnout protection to large motors — without extra cost. 8. Make protection of small motors simple and inexpensive. 9. Protect against waste of space and money — permit use of proper size switches and panels. 10. Protect coils, transformers and solenoids against burnout.



### **Fusetron Fuses Help eliminate needless Shutdowns for Production Engineers.**

Work stoppages caused by needless blows are prevented. Even if all the motors on a circuit start at one time or other harmless overloads occur, the fuse link holds to prevent a shutdown.

Likewise, Fusetron fuses guard against needless blows caused by excessive-heating in panelboards and switches — lesser resistance results in cooler operation.



### **Fusetron Fuses Offer Maximum Safety for Electrical and Safety Engineers.**

With an interrupting rating of 100,000 amperes, Fusetron fuses give the greatest possible protection against damage due to short-circuits. And just as important, they reduce the hazard of

motor burnouts due to single phasing and overloading.



### **Fusetron Fuses Save Time and Work for Maintenance Engineers.**

Once properly installed, Fusetron fuses require no costly inspection time or down-time for calibration and other maintenance necessary on mechanically operated devices.

Unnecessary repair work on motors is avoided because Fusetron fuses reduce to a minimum the danger of damage due to electrical faults. If trouble occurs, instead of rewinding or replacing burned out motors, simply replace Fusetron fuses.

Switches and panelboards are protected against damage from poor contact heating.

Fusetron fuses also protect against needless blows that cause irritating interruptions of regular maintenance.

*Proven*

On loads *ABOVE* 600 and up to 5,000 Amps.

## **BUSS Hi-Cap Fuses Have an Interrupting Rating In Excess of 100,000 Amps. . . and their blowing time can be coordinated with that of Fusetron fuses.**

An unlimited interrupting rating for BUSS Hi-Cap fuses on any voltage up to 600 . . . this was confirmed by tests reported by the Electrical Testing Laboratories of New York.

BUSS Hi-Cap fuses are designed to give protection against dangerous overloads as well as high fault currents — yet retain the speed of operation necessary to limit heavy short currents to safe values.

When coordinated properly with Fusetron dual-element fuses they will not open ahead of the fuse nearest to the fault — thus the trouble is isolated to the part of the circuit in which the fault occurs.

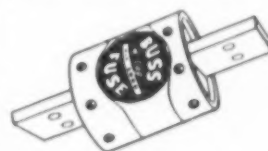
### **Added SAFETY on Old Installations**

On installations where the increase in the capacity of the circuit has outgrown the inter-

rupting rating of the circuit breakers, BUSS Hi-Cap fuses offer a safe and relatively inexpensive way to protect inadequate breakers against rupture in event of bad fault.

### **ACTION THAT SAVES YOU MONEY**

Don't risk losses. Delay may cost you far more than replacing every fuse with a FUSETRON fuse. By passing the word along that all purchase and stock records should call for FUSETRON dual-element fuses on loads up to 600 amperes — and BUSS Hi-Cap fuses on loads above that, you get action that begets money saving.



**On New Construction** tell your architect to specify this Safer, Better Protection.



### **Fusetron Fuses Cuts Cost for Top Management.**

**Cuts maintenance cost** — Fusetron fuses are maintenance free.

**Cuts motor repair cost** — Fusetron fuses guard the motor, against damage due to overloading, single phasing, short circuits and other electrical faults.

**Cuts production costs** — Shutdowns due to needless blows are eliminated.

**Cuts new installation costs** — Smaller sizes can be used, therefore big savings can be made on switches and panelboards.

**Cuts present installation costs** — Fusetron fuses hold and won't open on starting currents so the need for larger panelboards and switches is often eliminated — and in many cases new motors can be added to the circuit without installing larger panelboards or switches.

## **Play Safe—Install Fusetron Fuses and BUSS Hi-Cap Fuses now!**

For blowing time charts or more information on FUSETRON fuses and BUSS Hi-Cap fuses use coupon or write for bulletin FIS and HCS.



BUSSMANN Mfg. Co.  
(Division of McGraw Electric Co.)  
University at Jefferson, St. Louis 7, Mo.  
Please send me complete facts about FUSETRON dual-element Fuses and BUSS Hi-Cap Fuses.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City & Zone \_\_\_\_\_ State \_\_\_\_\_

# WHERE TO GET IT And How to Do It



## -INDEX OF HELPFUL BOOKLETS, BULLETINS, REFERENCE LITERATURE-

Cooperating with leading manufacturers of equipment and supplies, SPI makes available for the asking without cost or obligation, the following valuable bulletins, booklets, handbooks and catalogs.

Check the list, fill in Coupon, mail to SOUTHERN POWER & INDUSTRY. (Coupon Post Cards on pages 17 and 18.) This service restricted to those interested in the operation or design of Industrial, Power and Service Plants.

### STEAM TURBINES... FURNACES BOILERS, STOKERS, BURNERS

**1 STACKS, FANS, DUST COLLECTORS FOR POWER AND INDUSTRIAL PLANTS**—Catalog 206—Application data and illustrative views of Thermix fan-stacks, fans, tubular and duplex dust and soot collectors, multiclones, and recirculators for flue gas control.—PRAT-DANIEL CORPORATION & THERMIX ENGINEERING COMPANY.

**8 CHIMNEYS, ARCHITECTURAL AND INDUSTRIAL**—Pamphlet describes architectural and industrial chimneys in radial brick and reinforced concrete for all types of service—and a nation-wide maintenance service readily available for the repair, inspection, modification and dismantling of all types of chimneys.—CUSTODIS CONSTRUCTION COMPANY, INC.

**15 PACKAGE BOILERS**—Bulletin about complete line of water tube package boilers for process and heating service. Twelve sizes from 6,000 to 39,000 lb./hr. Pressures to 900 psig. Automatic. Gas or oil. Portable—indoor or outdoor installation.—SPRINGFIELD BOILER CO.

**25 DOUBLE-PASS BOILERS**—Bulletin 153—Gives complete specifications of a new double pass all-purpose industrial and heating boiler, "Southern made for Southern trade." Sizes from 44 to 153 hp S.B.L. with pressure up to 150 lb. designed for coal, gas or oil firing. This is a complete package double-pass unit, recently added to a regular line of single-pass firebox boilers manufactured since 1918.—LUCY BOILER & MANUFACTURING CORP.

**38 STEAM GENERATORS**—Bulletin SP-2—with photographs, cut-aways and typical boiler room layouts—describes Armstrong generators for oil or gas firing, from 10 to 600 hp, 15 to 200 lb steam pressure.—AMES IRON WORKS, INC.

**47 SINGLE STAGE TURBINES**—Bulletin 4215, 4 pages—Describes single stage turbines for steam conditions to 1450 psig, 550°F, 300 psig back pressure—with cross-section views and complete specifications.—DEVALAVAL STEAM TURBINE CO.

**52 SPREADER STOKERS**—Bulletin 60—Gives details, application data and complete illustration views of Rotafirst stokers which feature continuously forward moving grates—economical, adaptable, reliable.—DETROIT STOKER CO.

**55 HIGH-DUTY FIREBRICK**—Bulletin 103—Describes a complete line of high-duty dry-pressed firebrick for all sorts of furnaces—boiler, forge, gas plant, ceramic kilns, smoke stacks, incinerators, and the like—prompt shipment in convenient form.—THE IRONTON FIREBRICK CO.

**59 SPREADER STOKERS**—Bulletin 814-31 gives complete details on the design, application and operation of spreader stokers which burn a wide range of coals efficiently and economically, and result from over 100 years of steam generating equipment manufacture.—ERIE CITY IRON WORKS.

**61 ASH CONVEYORS**—Catalog, 3 pages—Guide in selection of steam pneumatic ash conveyor systems—description and illustration of special rotary feeders, cut-off valves, furnace doors—information on crushing, conveying and storing of ash, also of metal turnings and reclaimed oil for metalworking plants.—NATIONAL CONVEYORS CO., INC.

**84 PACKAGED BOILERS**—Booklet No. 102—Explains how the Continental boiler equals or better the economy and efficiency of other packaged boilers now available. Actual test reports are available to confirm statements made.—BOILER ENGINEERING & SUPPLY COMPANY, INC.

### FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**108 RECIPROCATING COMPRESSOR**—Bulletin M-70, 44 pages—The M-Line multi-stage, multi-cylinder, 100 to 5000 hp, 250 to 514 rpm reciprocating compressors. Applications and installations illustrated with photographs and cut-away views.—THE COOPER-HESSEMER CORP.

**113 DESIGNED PUMPS**—R. H. Bird, Engineering Designer for Peerless, presents a technical article on the Proper Proportioning of Pumps, complete with illustrations, diagrams and engineering data.—PEERLESS PUMP DIVISION, FOOD MACHINERY & CHEMICAL CORP.

**127 GENERAL FANS**—Bulletin T-158—A general catalog—describes company's complete line of fans, including large commercial and industrial type fans designed to properly ventilate plants and other enclosures, and increase morale and efficiency.—THE EMERSON ELECTRIC MFG. CO.

**161 PROCESS AND CHEMICAL PUMPS**—Bulletin WQ-213, 4 pages—Gives exterior and sectional views, special features, specifications, dimensions, selection chart, etc. of process and medium duty chemical pumps.—WARREN STEAM PUMP CO., INC.

**166 CONCENTRATORS**—Bulletin 119 and Bulletin 118—Describe the new "No Frost" concentrators, with applicational and equipment illustrations and a comparative chart which shows the development of methods.—NIAGARA BLOWER CO.

**167 ROTARY PUMPS**—Bulletin 307—Describes the features and advantages, and outlines the engineering details of Blackmer rotary pumps. These have been manufactured since 1904 and incorporate the outstanding advantages of "automatic adjustment for wear," and economical replacement of parts.—BLACKMER PUMP CO.

**176 HEATER MAINTENANCE**—Bulletin 114-9 and Check Chart—Gives points to be checked in unit heater maintenance. Installation and maintenance procedures for Wing industrial heaters.—L. J. WING MFG. CO.

**184 PUMPS**—Bulletin, 24 pages—Describes centrifugal and piston pumps, and various allied equipment, designed and produced by an organization with half a century of experience in building pumps for all services.—CONDENSER SERVICE & ENGINEERING CO., INC.

**196 INDUSTRIAL HEATERS**—Bulletin RC-10-53—Describes the Thermobloc heat machine producing heat in any desired quantity and placing it where needed—an independent unit heater with economical principles of direct heat transfer—low cost, automatic operation, tempered air, ease of installation, complete range of sizes from 100,000 Btu per hour to 1,000,000 Btu per hour.—PRAT-DANIEL CORP., THERMOBLOC DIV.

### INSTRUMENTS—METERS CONTROLS—REGULATORS

**214 STEAM REDUCING VALVES**—Bulletin 1A—Describes Atlas regulating valves, particularly the Type H steam reducing valve with remarkable wear resisting qualifications.—ATLAS VALVE CO.

**240 HUMIDITY CONTROL**—Bulletin 302—Describes the new Type 190 Hygrostat which gives accurate humidity control—pneumatically operated and sensitive to the slightest changes.—POWERS REGULATOR CO.

**242 CONTROL VALVES**—Catalog 1600, B—Illustrated—Describes complete line of Domotor, solenoid-operated and handwheel single seat control valves for handling difficult fluids under extremes of temperature and pressure. Offers full, unrestricted flow, positive plug and seat alignment and directional flow flexibility.—THE ANNIN COMPANY.

**249 WATER COLUMNS**—Unit 232—Describes, illustrates and gives specifications on Jerguson water columns. Principle of operation and features to assure positive alarm signals if boiler water falls too low or rises too high, are explained.—JERGUSON GAGE & VALVE CO.

**253 FEEDWATER CONTROL**—Bulletin 163-C discusses problems encountered in feedwater control and tells how Bailey three-element air-operated feedwater control helps solve them.—BAILEY METER CO.

**269 CONTROL VALVES AND TRAPS**—Bulletin 552—Describes control valves and steam traps for particular application in the heating, compressing and operating of molding presses in plastic molding.—W. H. NICHOLSON & CO.

### PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

**325 SMOKE STACKS, STEEL OR IRON**—Catalog 200-B—Describes types, characteristics, and applications of various smoke stacks.—J. J. FINNIGAN CO., INC.

**326 GRATING—FLOORING**—Catalog, 12 pages—Gives picture story of "Weldforged" steel grating, flooring and stair treads—continuous spiral cross bars, alternating right and left, and slightly above bearing bars, electronically welded into inseparable units to insure greater non-skid protection and durability.—KERRIGAN IRON WORKS, INC.

**336 PLASTIC PIPE**—Booklet, 12 pages—Describes and gives engineering details of Alpha 101 normal impact plasticized straight polyvinyl chloride and Alpha 103 high impact unplasticized modified polyvinyl chloride plastic pipe and fittings. This new piping is light in weight, easily installed and fabricated, with excellent chemical resistance, good tensile and flexural strength, lending itself to many applications, particularly in chemical and process plants. Complete details on properties and sizes, applications and fabrication.—ALPHA PLASTICS INCORPORATED.

**340 VERTICAL TRANSPORTATION**—Elevator Catalog—Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants.—OTIS ELEVATOR CO.



**356 INDUSTRIAL SPACE HEATERS**—Bulletin GNC-10-52 and EDB-1-53—Picture and describe direct fired space heaters in sizes from 100,000 Btu to 1,000,000 Btu—oil or gas fired, floor mounted or suspended.—FRAT DANIEL CORP.

**360 STEAM ACCUMULATORS**—Bulletin RA-52-9—Describes well known steam accumulators to balance steam supply and steam demand in intermittent processes such as are found in brewing, food processing, refining, paper and textile plants.—FOSTER WHEELER CORP.

**366 INDUSTRIAL HEATERS**—Bulletin RC-10-53—Describes the Thermobloc heat producing machine producing heat in any desired quantity and placing it where needed—an independent unit heater using the economical principles of direct heat transfer—low cost, automatic operation, tempered air, ease of installation, complete range of sizes from 100,000 Btu per hour to 1,000,000 Btu per hour.—FRAT DANIEL CORP., THERMOBLOC DIV.

**394 ASH CONVEYORS**—Catalog, 8 pages—Guide in selection of steam pneumatic ash conveyor systems—description and illustration of special rotary feeders, cut-off valves, furnace doors—information on crushing, conveying and storing of ash—adaptable to metal turnings and oil recovery in metalworking plants.—NATIONAL CONVEYORS CO. INC.

#### PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

**408 SPRING HANGERS AND VIBRATIONAL ELIMINATORS**—Bulletin 2026 describes modern, original designs of functional spring hangers, and vibrational eliminators which permit engineers to correlate the design of power piping for flexibility. Engineering data as to proper method of installing supports, eliminate vibration, absorb shock and control movements.—BLAW-KNOX CONSTRUCTION CO., POWER PIPING DIV.

**411 STEAM TRAPS**—Bulletin No. 3133, 8 pages—Includes physical data, prices on cast iron and forged steel inverted bucket steam traps, air and air relief traps. How to calculate condensate loads.—ARMSTRONG MACHINE WORKS.

**425 PRESSURE SEAL VALVES**—Catalog 12-8, 16 pages—Describes stop, check and non-return valves, giving complete engineering and dimensional details. Sizes from 2 1/2 in. to 14 in. in 400, 900, 1500 and 2500 lb pressure classes. Tables and charts for calculating pressure drops and other information.—EDWARD VALVES, INC.

**441 ALUMINUM PIPE JACKETING**—Folder—Describes aluminum weather-proof jacketing for the protection of outdoor insulated pipe lines, towers, tanks and vessels. Complete information, price list and samples of this cost-cutting product available on request.—CHILDERS MANUFACTURING CO.

**443 REDUCING VALVES**—"Atlas Reducing Valve Data Book"—Gives complete information on Type "D" reducing valves of simple design, easy to inspect, adaptable, durable.—ATLAS VALVE CO.

**444 PRESSURE REDUCING VALVES**—Bulletin 228, 8 pages—Describes and illustrates No. 323 pilot operated pressure reducing valves including illustrations, cutaway views, installation diagrams, tables of capacities and other information. Data on associated equipment.—MCALP MANUFACTURING COMPANY.

**463 JACKETED VALVES**—Bulletin 320 and 321—Describe operational features of jacketed valves for gages or where small jacketed angle valves are required. Full specifications, cutaway views, applications.—JERGUSON GAGE & VALVE COMPANY.

**488 HEAVY-DUTY WELDED FLOATS**—Bulletin 450—Describes types for all uses as operating mechanisms and storage vessels, pressures to 3000 lb; 3" to 14" diameter. Stainless, monel, steel. Gives formulas for figuring volume and buoyancy requirements.—W. H. NICHOLSON & CO.

**491 CONTROL VALVES**—Catalog 1500-B, illustrated—Describes complete line of Domotor, solenoid-operated and handwheel single seat control valves for handling difficult fluids under extremes of temperature and pressure. Offers full, unrestricted flow, positive plug and seat alignment and directional flow flexibility.—THE ANNIN COMPANY.

**493 UNIONS AND CHECK VALVES**—New Catalog—Shows complete line of Perfect Seal forged steel unions and swing check valves, complete with sizes, pressures, and engineering data.—CATAWISSA VALVE & FITTINGS COMPANY.

#### MAINTENANCE PACKING GASKETS, LUBRICATION

**523 HEAVY DUTY CLEANER**—Service Report, 2 pages—Tells application of Oakite Composition No. 24, a new detergent designed to remove extra heavy solids from iron and steel in one operation. Purpose, method of application, and suggested uses described.—OAKITE PRODUCTS, INC.

**565 CONTROLLED LUBRICATION**—Service Handbook, 56 pages—Describes the Lubriplate film and how its application arrests progressive wear, protects machinery, cuts down costs, and serves diversified applications in industrial, utility and service plants.—LUBRIPLATE DIVISION, FINEK BROS. REFINING CO.

**569 METAL PROTECTION**—Dum Dum Masonic Bulletin B-57—Describes a metal protective coating for storage tanks, gas holders, outside metallic equipment and plant accessories—guarding against weather, fumes, acids, alkalies and moisture.—THE ARCO COMPANY.

**574 ANTI-CORROSION PAINTS**—Bulletin, "25th Anniversary Edition" and color cards—Describes a complete line of anti-corrosive paints for protection against weather, moisture and alkali, with details as to application.—SUBOX, INC.

**576 MECHANICAL SEALING**—Catalog 455-SD—A family album describing various types of dura seals designed to meet specific operating conditions—a complete reference guide book.—DURAMETALLIC CORP.

#### ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

**616 BEARINGS & BUSHINGS**—Catalog No. 52—Gives a complete listing of all stock sizes, patterns and styles of fully machined bronze bearings, bronze bars, and electric motor bearings.—THE BUNTING BRASS & BRONZE CO.

**619 WOVEN WIRE SLINGS**—Illustrated handbook shows construction details of gripper woven wire slings, with views showing how such slings are used for both production work and general materials handling.—THE CAMBRIDGE WIRE CLOTH CO.

**621 POWER TRANSMISSION AND EQUIPMENT**—Catalog 46—Gives comprehensive details of a complete line of power transmission including V-Belt drives, flat belt drives, pulleys, gears, chains, sprockets.—Industrial Division of CONTINENTAL GIN CO.

**643 AUTOMATIC MONORAIL TRANSPORTATION**—Bulletin AD-1A, 18 pages—Describes a complete range of automatic dispatch monorail systems for transfer of materials by remote control.—AMERICAN MONORAIL CO.

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Equipment and Review Editor  
SOUTHERN POWER AND INDUSTRY  
806 Peachtree St., N. E.  
Atlanta 5, Ga.

10-54-1

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1	8	15	25	38	47	52	55	59	61	84	100	113	127	161	166	167
176	184	196	214	240	242	249	253	269	325	326	336	340	356	360	366	394
408	411	425	441	443	444	463	488	491	493	523	565	569	574	576	616	619
621	643	647	685	708	756	762	768	775	790	840	854	855	861	876	895	914
934	956	959	960	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13
V-14	V-15	V-16	V-17	V-18	V-19	V-20	V-21	V-22	V-23	V-24	V-25	V-26	V-27	V-28	V-29	

Also send further information on following New Equipment (page 184)

K-1	K-2	K-3	K-4	K-5	K-6	K-7	K-8	K-9	K-10	K-11	K-12	K-13	K-14
K-15	K-16	K-17	K-18	K-19	K-20	K-21	K-22	K-23	K-24				

Name ..... Position .....

Company Name .....

Street .....

City ..... Zone ..... State .....

**647 STEP TRUCKS**—Circular T-100—Describes the Step-Truck—a combination two wheel hand truck and step-ladder offering innumerable savings in time and energy in plant maintenance operations in stock rooms, and on local delivery trucks. **THE FAIRBANKS COMPANY.**

**685 POWER TRANSMISSION PROBLEMS**—Brochure, 8 pages—Discusses flexible couplings, variable speed pulleys and transmissions, universal joints, and gives specifications and information for the application and selection of equipment, all well illustrated.—**LOVEJOY FLEXIBLE COUPLING CO.**

# **WATER TREATMENT, HEATING, VENTILATING, AIR CONDITIONING, REFRIGERATION, DUST & FUME CONTROL**

**708 COOLING TOWER DRIVES**—Catalog CT-63—Gives information on the use of gear reduction drives for cooling tower applications—includes worm gear units, spiral-bevel units and helical-spiral-bevel units. Gives construction and operating details, with illustrations and selection data.—**PHILADELPHIA GEAR WORKS.**

**756 HEATERS DEAERATORS AND HOT PROCESS SOFTENERS**—Bulletin No. 103 describes the Belco exclusive atomizing valve available in capacities of 1 to 3,000 gpm. Belco open heaters, deaerators and hot process softeners are also illustrated and described.—**BELCO INDUSTRIAL EQUIPMENT DIVISION.**

**762 INDUSTRIAL WASTE TREATMENT**—Bulletin WC-116, 4 pages—Photographs, schematic drawings, explanatory text show how Graver equipment solves such problems as process and cooling water shortages, contamination of streams with plant effluents, and loss of heat and materials in discarded waters and process liquors in various industries.—**GRAVER WATER CONDITIONING CO.**

**768 STEAM HUMIDIFIERS**—Bulletin No. 1775, 12 pages—Explains electric and air operated units which introduce steam into atmosphere to bring humidity up to desired level. Selection, installation, prices, diagrams.—**ARMSTRONG MACHINE WORKS.**

**775 WATER TREATMENT FOR COOLING TOWERS**—Bulletin 28X7501A—Discusses types of cooling systems and corrosion problems of metal surfaces—inorganic scaling—organic growths such as algae and slime, delignification of wood in towers. Selection data given.—**ALLIS-CHALMERS MFG. CO.**

**790 HOT PROCESS WATER SOFTENER**—Bulletin 2341—Describes the sludge blanket type equipment used for softening, reducing alkalinity and total solids, and removing silica. By adding a second stage treatment, Permutit & Hot Zeolite Softener, residual hardness is completely removed, thus lowering phosphate costs.—**THE PERMUTIT CO.**

## **ELECTRICAL**

**840 MOTOR ACCESSORIES, CONTROLS**—Catalog, 76 pages—Gives complete information regarding switches, starters, contactors, speed regulators, and

various accessories for electric motors, complete with illustrations, condensed general data, dimensions, prices, etc.—**ALLEN-BRADLEY CO.**

**854 ADEQUATE WIRING**—Booklet "Wire Ahead"—Discusses preventive maintenance in electrical systems—the symptoms of inadequate wiring—and plans for anticipating electrical demands.—**ANACONDA WIRE & CABLE COMPANY.**

**855 WIREWOUND RESISTORS**—Catalog 101—Describes power type fixed wirewound resistors manufactured in accordance with the requirements of Military Specification MIL-R-36B—Gives complete series of standard resistor values and maximum permissible currents.—**SPRAGUE ELECTRIC COMPANY.**

**861 FUSETRON FUSES**—Booklet—Gives complete facts on Fusetron dual-element fuses, a combination fuse and thermal cut-out of low electrical resistance and high time lag—prevents shut-downs, saves maintenance costs.—**BUSSMANN MFG. CO.**

**876 LOW VOLTAGE SWITCHGEAR**—Bulletin 6004A, 24 pages—Describes I-T-E low voltage switchgear, with diagrams, photographs and other illustrations; gives information on features, on components, on applications, on specifications and on construction.—**I-T-E CIRCUIT BREAKER CO.**

**895 SIGNAL CABLES**—Catalog W-9-3—Describes the construction, characteristics, tests and specifications of Laytex insulated cable for fire alarm, police signal, plant signal, supervisory control and other applications.—**UNITED STATES RUBBER COMPANY.**

## **MISCELLANEOUS . . . SAFETY, BUILDING EQUIPMENT, METALS**

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**934 GRATING, FLOORING, TREADS**—Catalog—Describes the design and value of Bondrite processed "Weldforged" steel grating, flooring and stair treads for corrosion resistance, paint adhesion and prolonged life.—**KERRIGAN IRON WORKS, INC.**

**956 SWIMMING POOL EQUIPMENT**—Bulletin WC-109—Describes a complete line of swimming pool equipment, including filters, chemical feeders, sterilizers, hair and lint catchers, pool cleaners, recirculating pumps, heaters, fittings and accessories.—dimension, capacity and other tables.—**GRAVER WATER CONDITIONING COMPANY.**

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**960 UNIT HEATERS**—Thermolier Catalog—Describes the important features of Thermolier unit heating, an economical method of adequate plant heating.—**GRINNELL CO., INC.**

*Continued on page 170*

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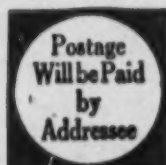
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## DISCOURAGEMENT TO FIRES

The 100,000-gallon Horton Watersphere<sup>®</sup> shown at right and 1480 sprinkler heads are discouraging any fires that may break out at the Rubatex Division of Great American Industries, Inc. at Bedford, Virginia. Used solely to supply water to the sprinkler system, the Watersphere provides the secondary water supply with the primary supply being obtained from Bedford's municipal water system.

The Horton Watersphere provides the Rubatex Division with a dependable gravity water supply that is available twenty-four hours a day. In the event of pressure failure in the city's mains during an emergency, water from the Watersphere would immediately flow to the plant's sprinkler heads to bolster lagging pressure and help quench any fire.

The installation of a Horton Watersphere or Horton<sup>®</sup> elevated tank often helps obtain a better insurance rating. In this manner, many tanks help pay for themselves in a few short years. When planning fire protection for your plant be sure to write our nearest office for information, estimates or quotations on a Horton Watersphere or elevated tank. There is no obligation on your part.



## CHICAGO BRIDGE & IRON COMPANY

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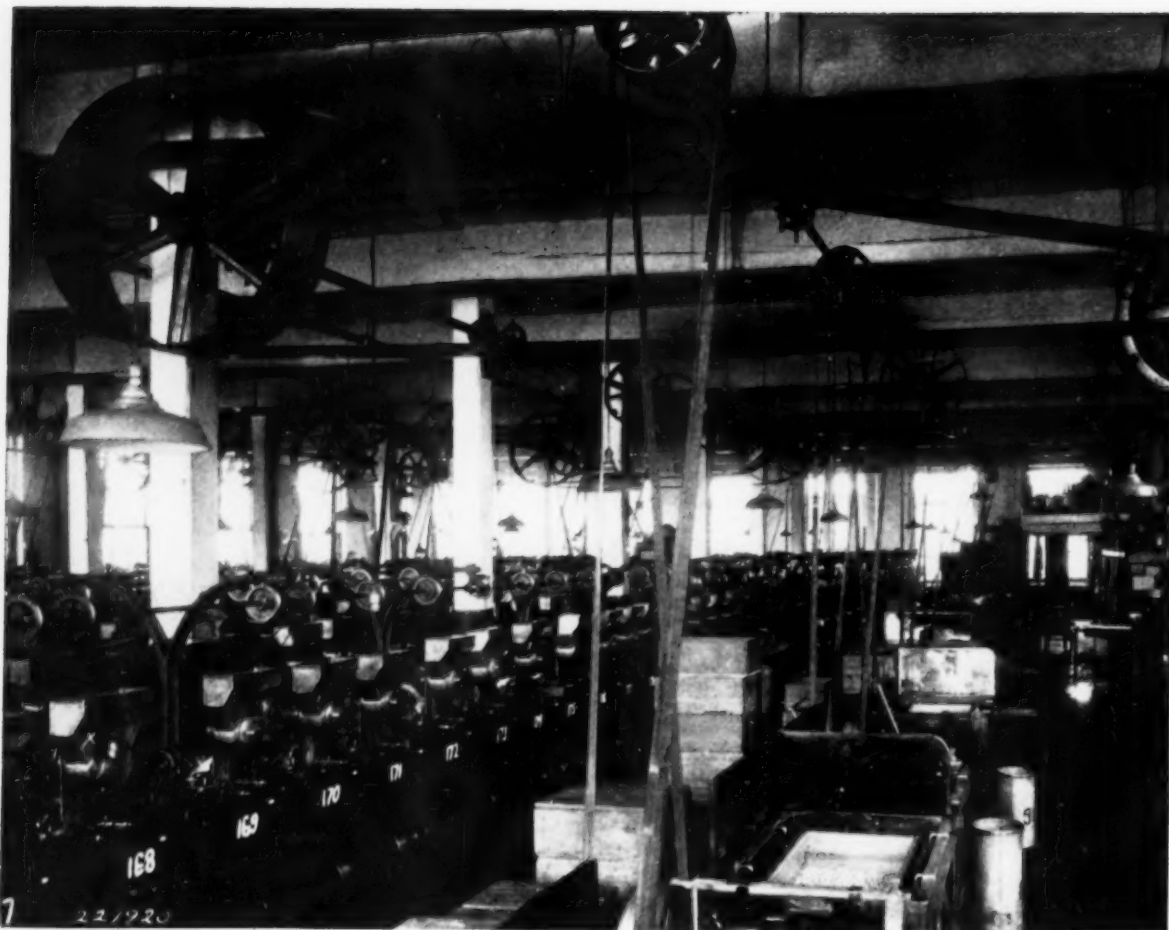
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Los Angeles 17.....1545 General Petroleum Bldg.  
New York 6.....3312—165 Broadway Bldg.  
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Pittsburgh 19.....3252 Alcoa Bldg.  
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San Francisco 4.....1531—200 Bush St.  
Seattle 1.....1345 Henry Bldg.  
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**T**HE *right* cutting oil for the job gives cutting tools longer life, reduces rejects; produces cleaner cuts and finer finishes. Throughout the South, producers of machine tools and precision instruments have learned from experience that they can depend on Standard Oil Cutting Oils to help them secure improved finish, closer tolerances; and to cushion against shock and protect tools from wear in cutting, drilling, reaming

and tapping. Because of their great cooling effect, they make high speeds possible. There is a Standard Oil lubrication engineer in your area. His accumulated experience on lubrication in your field will be helpful. His services cost you nothing—they may save you much.

**Standard Oil Company**  
(KENTUCKY)





**"33,000  
HOURS  
proved  
the choice  
was right!"**



When a prominent North Carolina community converted its power plant to diesel operation, it called in Sinclair Lubrication Engineer Jim Holt for his recommendations on proper lubricants.

Mr. Holt reports, "I recommended Sinclair RUBILENE<sup>SM</sup>. My previous experience convinced me that this diesel lubricating oil would provide maximum wear protection for this power plant's six 1000 K.W. diesel engines. RUBILENE also guards against sticking rings and prevents excessive wear of cylinders, pistons and other moving parts operating continuously for long periods.

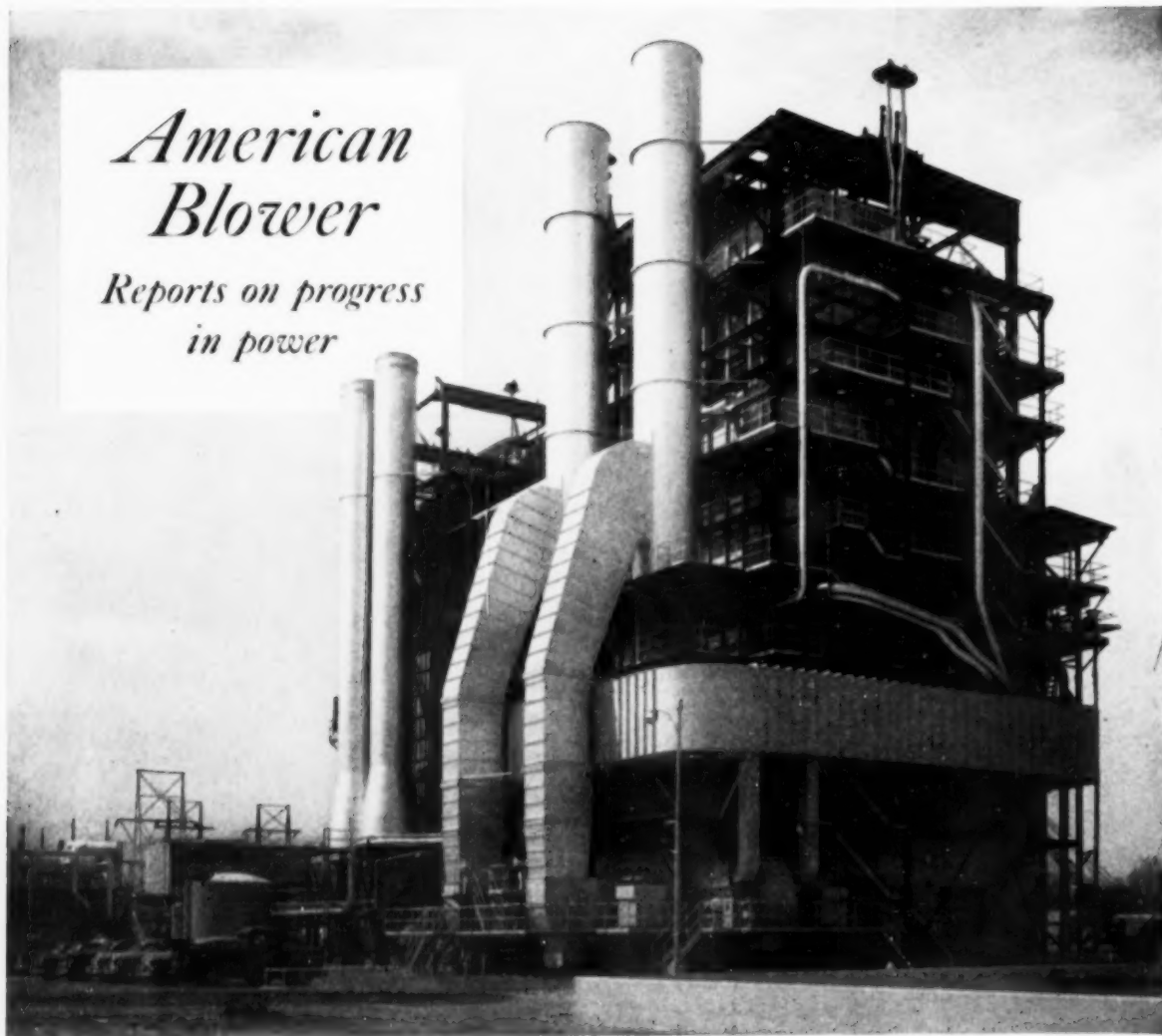
"RUBILENE was the right choice," Mr. Holt continues. "After 33,000 hours of near-continuous operation, bearings show very little discernible wear — and there's not a sign of erosive or corrosive action. *Oil consumption is remarkably low*, considering the prolonged operating hours under overload. All six 1000 K.W. engines, with a total output of 6400 K.W. per hour, use a total of only 1 barrel of oil a day!"

Why not give a Sinclair Lubrication Engineer the chance to help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

## **SINCLAIR DIESEL LUBRICANTS**

## *American Blower*

*Reports on progress  
in power*



● Up-to-date Ninemile Point Plant, near New Orleans, will have 310,000 kw capacity, when a third steam generating

unit is completed in 1955. LP&L Co.'s other steam-electric plant, Sterlington Station, has 146,000 kw capacity.

# Louisiana Power installs the first

## **American Blower plays an important role in the LP&L Co. expansion program**

Scheduled for completion in early 1955, the third unit of Louisiana Power & Light Company's Ninemile Point Plant will be the first gas-fired unit in the country to employ the reheat cycle. By re-heating steam in the boiler after it has done part of its work in the turbine, the reheat cycle promises fuel savings and greater operating efficiency!

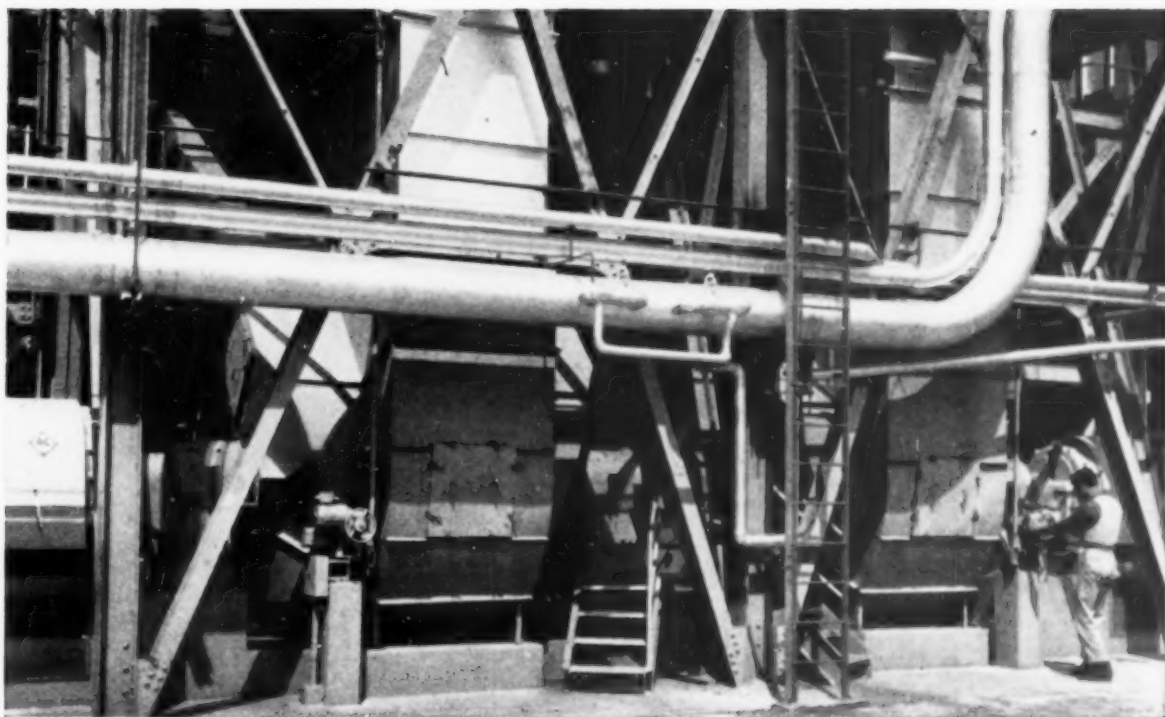
The new unit will boost capacity at Ninemile Plant to 310,000 kw. Its boiler will stand 11 stories high, have a high-speed elevator for rapid access to

all operating levels and will be capable of producing 1,000,000 lbs. of steam per hour at a pressure of 1,525 pounds per square inch at 1,005° F.

Another unique feature at Ninemile Point Plant will be the commercial use of television for supervising the burning of natural gas in the boiler furnace. The control room operator will be able to light, adjust and control the furnace gas burners without leaving his station!

American Blower Forced and Induced Draft Fans

*Serving home and industry:* **AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL**



- Two American Blower Induced Draft Fans are installed in the Ninemile Point Plant. Each has capacity of 143,500 cfm at 695 rpm with 8.3" sp. Driving power required is 319 hp.

● This is one of two American Blower Forced Draft Fans at the Ninemile Point Plant. Each has a capacity of 78,000 cfm at 9.07" sp when operating at 1160 rpm requiring 164 hp.



## gas-fired unit with reheat cycle!

have played an important part in LP&LC's expansion program. American Blower also makes Dust Collecting Equipment, Fly Ash Precipitators and Gyrol Fluid Drives for boiler feed pump and fan control.

If you plan to modernize or expand your facilities, talk over your problems with any American Blower engineer. His knowledge of the application of air-handling equipment and Gyrol Fluid Drives can prove invaluable to you. Contact your nearest American Blower Branch Office, or write us direct.

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN  
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO  
Division of American Radiator & Standard Sanitary Corporation

**AMERICAN**  **BLOWER**

TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS  
SOUTHERN POWER & INDUSTRY for OCTOBER, 1954

***"7,125 men and women  
signed up to join those  
already saving for their  
financial security..."***

**GEORGE H. COPPERS**

*President,  
National Biscuit Company*



***"There is no greater honor than partnership in an enterprise as important to a nation as the Payroll Savings Plan for United States Savings Bonds. We view our recent person-to-person canvass of employees in behalf of Bonds as practical patriotism. It supports our Government's efforts to stabilize the value of the dollar. The campaign also benefited our employees. 7,125 men and women signed up to join those already saving for their financial security in this easy, automatic way."***

The Payroll Savings Plan is the backbone of Series E Bond Sales. 8,500,000 employees in more than 45,000 companies invest more than \$160,000,000 in Savings Bonds every month.

The person-to-person canvass is the keystone of The Payroll Savings Plan. In company after company person-to-person canvasses conducted by employees have increased participation to 60%, 70% — even 90% plus.

Why don't you conduct a person-to-person canvass in your company? Here are two, simple steps:

- Tell the Savings Bond Division, U.S. Treasury Department, Washington, D.C., you want to conduct a person-to-person canvass, they will show

you how easy it is to install the plan.

- Over your signature tell your men and women you are 100% behind the Payroll Savings Plan because it enables them to build personal security . . . it is a check on inflation and helps to stabilize the dollar . . . it has set up a reservoir of reserve purchasing power—over \$37.5 billion—the cash value of Savings Bonds held by individuals at the end of July, 1954. The greatest reserve of purchasing power this or any other country has ever had.

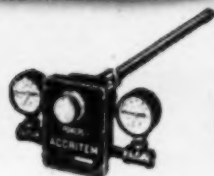
Your phone call, telegram or letter to Savings Bond Division, U.S. Treasury Department, Washington 25, D.C., will bring prompt co-operation from your State Savings Bond Director. Act today.

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Above: **POWERS ACCRITEM** Temperature Regulator, is water or compressed air operated. Controls **FLOWRITE** diaphragm valve (right). Widely used for Water Heaters and Industrial Processes.



**POWERS Type H** Thermostatic Water Mixers insure utmost comfort and safety in showers and other types of baths.

Also used for many processes. Users report  $\frac{1}{2}^{\circ}$  F.  $\pm$  accuracy. Capacities 5 to 10 gpm. @ 45 psi.



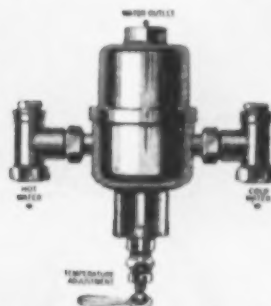
**Powers No. 11** Self-Operating Regulator widely used for water storage heaters, heat exchangers, fuel oil pre-heaters and many industrial processes.

## WATER Temperature CONTROL?

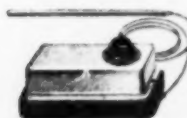


**Powers Series 100** Recording Controller. Compressed Air Operated.

**POWERS FLOWRITE** V-Port-Characterized Diaphragm Control Valve.



**Powers Thermostatic Water Controller** for regulating temperature of multiple type showers, hydro-therapy and industrial processes. Capacities 22 to 125 gpm. @ 45 psi.



**Powers Remote Bulb Type D** Thermostat for Unit Air Conditioners.



**POWERS PACKLESS VALVES**

For controlling chilled, or heated water in unit air conditioners. No leakage. No packing maintenance.



**Powers MASTROL** Control for regulating forced hot water heating systems.

### Call **POWERS**

Most Complete Line of Controls Made  
Only a few are shown here

for All Types of Baths, Water Heaters and Heat Exchangers

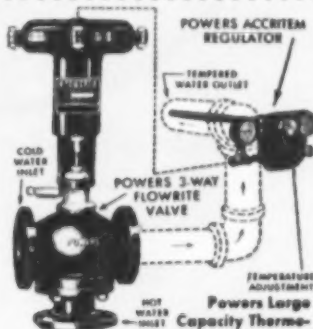
- Forced Hot Water Heating Systems
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- Air Conditioning Units using Chilled and Heated Water
- Cooling Water for Air Compressors, Diesel, Gas Engines, and Cyclotrons
- Many Industrial Processes: Photo Developing, X-Ray, Color and Ordinary Film, Lens Polishing and Grinding, Chocolate Enrobers, Plastic Molding Presses, etc.



Our More than 60 Years Experience will be valuable in helping you select the right control for your requirements. Contact our nearest office or Write us direct for Condensed Catalog Rb 24.

**THE POWERS REGULATOR CO.**

Skokie, Ill. • Offices in Over 50 Cities in the U. S. A., Canada and Mexico  
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101 N. Elm St., Greensboro, N. C.



**Powers Large Capacity Thermostatic Water Mixing Valve** Controlled by an **ACCRITEM** Temperature Regulator. Capacities 20 to 1200 gpm. @ 45 psi.



**Powers Room Type** Pneumatic Controls for Radiant Heating-Cooling Panels, Convectors and Unit Ventilators. Valves are packless. No more packing maintenance. No leakage.



## Improve Production

with...

## April Showers

Automatic Evaporative

### ROOF COOLING

Spray Method

Here are Facts about April Showers that have helped  
"Improve Production" for other Companies

- Increases employee efficiency • Lowers temperatures of upper floors 8° to 15° • Reduces loads of true air conditioning systems as much as 25% • Used on all types and shapes of roofs on Industrial, Commercial and Residential buildings • Thermostatically controlled; no pool, no run off • Installation is simple, inexpensive, fool-proof • Operating and maintenance costs are negligible • Spray Method is far superior to Ponds.

Automatic Roof Cooling, the logical first step in any Air Conditioning program . . . WRITE FOR COMPLETE INFORMATION OR  
FREE ESTIMATES

**APRIL SHOWERS CO., INC.**

WASHINGTON 11, D. C.

Over 19,500,000 Square Feet of Roofs Cooled  
by April Showers. Ideal for Southern plants.  
No Run-off. Absolutely Fool-proof. Low Cost.

(Partial List of Users) E. I. duPont de Nemours & Co., Inc. (STORES: 19,549 sq. ft., Shops: 17,772 sq. ft., Shipping Dept.: 43,902 sq. ft.), Martinsville, Va. • Calhoun Garment Co., (44,660 sq. ft.), Calhoun City, Miss. • Williamson Hosiery Mills (5,430 sq. ft.), Athens, Tenn. • Saxon Trouser Company (20,000 sq. ft.), Aberdeen, Tenn. • Athens Hosiery Mills (2,553 sq. ft.), Athens, Tenn. • Livingston Shirt Corp. (24,544 sq. ft.), Livingston, Tenn. • The Russell Mfg. Co., (40,640 sq. ft.), Alexander City, Alabama. • Write-Right Mfg. Co., (44,352 sq. ft.), Chamblee, Ga. • Appalachian Mills (10,089 sq. ft.), Knoxville, Tenn. • Eastman Cotton Mills (30,785 sq. ft.), Eastman, Ga. (And such others as): Lilly Tulip Cup Co., Westinghouse Electric Co., Bulova Watch Co., General Electric Co., Eastman Kodak Co., and many others.

★ Besides cooling "under-roof" areas, April Showers adds longer life to roofs, gives added protection in case of fires and acts as a lightning-arrestor.

*April Showers is Patented*



**3¢**

**just saved me  
900 dollars**

**T**HAT's what I said—3 cents. The cost of a postage stamp — the stamp I used to mail an inquiry to National Tube.

You see, we just put an addition on the plant. It was my job to specify the pipe and tubing. I had decided to buy NATIONAL Seamless because we'd already used it with great success for boiler-feed lines as well as main steam piping.

However, the higher temperatures and pressures we planned to use made me a little apprehensive as to the analysis I should select. After a good deal of thought, I chose a high alloy steel in a heavy-weight seam-

less grade. I prefer to keep on the heavy side of weight tolerances rather than on the light side. It's safer.

Before I turned in my recommendation for the analysis, though, I decided to ask National Tube about it—just to be sure. That's when I stuck that lucky 3-cent stamp on the envelope and sent it to National's district office.

A National engineer came out, looked the plant over, did a little figuring, and handed me the *correct* analysis.

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for the job. When the costs were figured, the material recommended by National Tube was 900 dollars *less* than the type I had selected. And the advice hadn't cost me a cent.

Let me tell you—National Tube helps make sure you get the *right* pipe or tube for the job, everytime. And at the least cost to you. So why take chances?



NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.  
(Tubing Specialties)

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**U·S·S NATIONAL Seamless PIPE AND TUBES**

**UNITED STATES STEEL**



# Now...

# reheat

In recent years, many public utility companies purchased *reheat steam generating units* for highest practical economy of power production, but most of them were designed for large turbines with rating of 75,000 kw. and more.

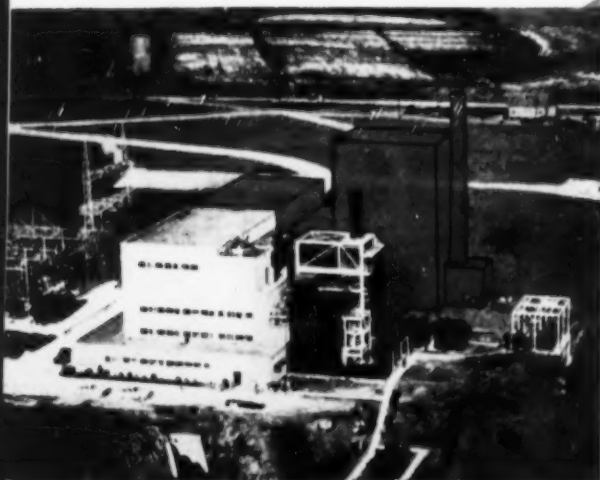
Central Louisiana Electric Company, Inc., after thorough consideration and study of economic factors, concluded that extra capital expenditure for reheat was warranted for new steam generating facilities at its Teche Power Station, Baldwin, Louisiana.

This small, compact 350,000 lbs./hr. Riley reheat steam generating unit will provide steam for a reheat turbine of 50,000 kw. nominal rating. The design is the result of close cooperation of engineers of Central Louisiana Electric Company, Sargent and Lundy and Riley.

**small,  
compact  
350,000 lbs./hr.  
RILEY reheat unit  
will power a  
50,000 kw.  
turbine**

If you are considering meeting relatively moderate power demands with a medium sized steam generating unit, it will possibly pay you to consider the advantages offered by this small reheat design. With the addition of Riley's exclusive single header hopper bottom this basic design can be readily adapted to pulverized coal firing.

*A survey of your Power Plant by a consulting engineer will possibly show ways of making surprisingly large savings in your power costs*





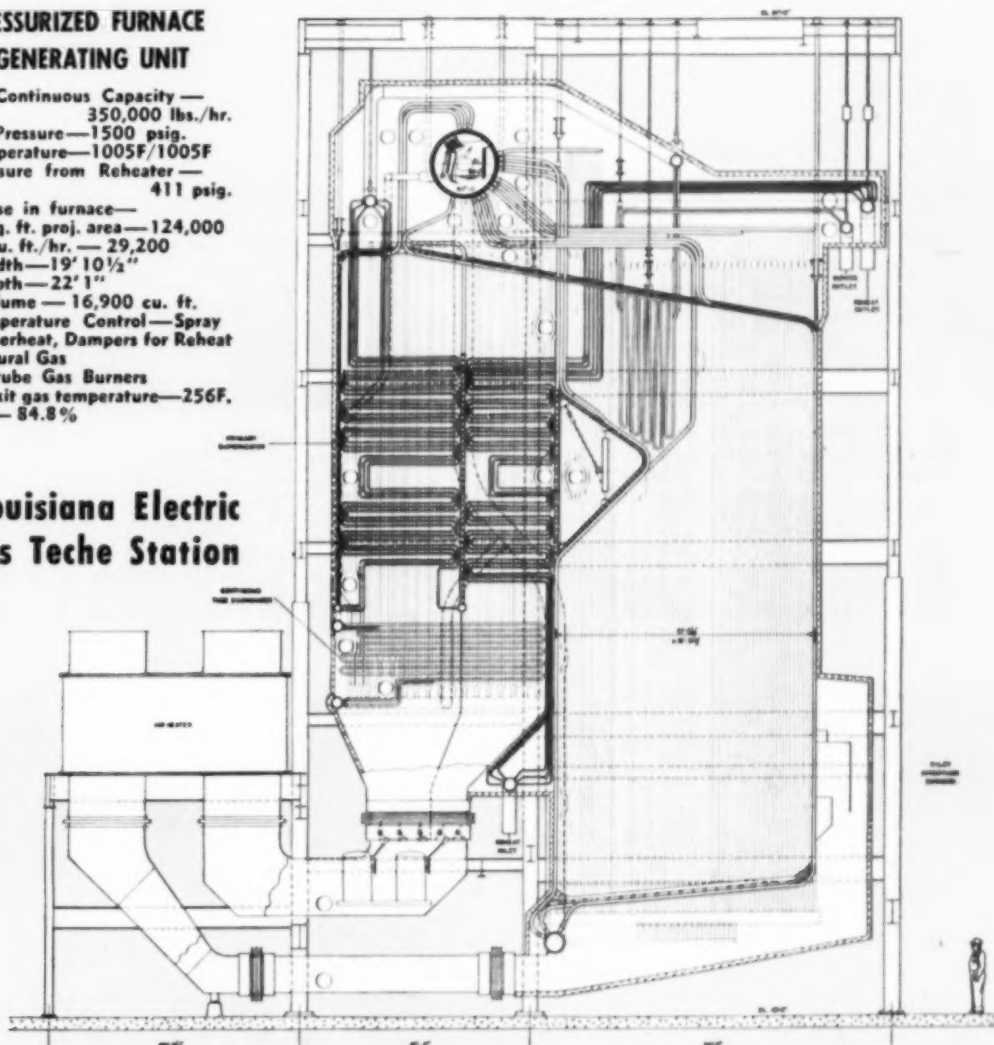
# for the smaller steam turbine!

## RILEY PRESSURIZED FURNACE STEAM GENERATING UNIT

Maximum Continuous Capacity —  
350,000 lbs./hr.  
Operating Pressure — 1500 psig.  
Steam Temperature — 1005F/1005F  
Steam Pressure from Reheater —  
411 psig.  
Heat Release in furnace —  
btu./sq. ft. proj. area — 124,000  
btu./cu. ft./hr. — 29,200  
Furnace width — 19' 10 1/2"  
Furnace depth — 22' 1"  
Furnace volume — 16,900 cu. ft.  
Steam Temperature Control — Spray  
for Superheat, Dampers for Reheat  
Fuel — Natural Gas  
Riley Intertube Gas Burners  
Airheater exit gas temperature — 256F.  
Efficiency — 84.8%

at Central Louisiana Electric  
Company's Teche Station

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&  
LUNDY,  
Consulting  
Engineers



# RILEY

*Stoker Corporation*  
WORCESTER, MASSACHUSETTS

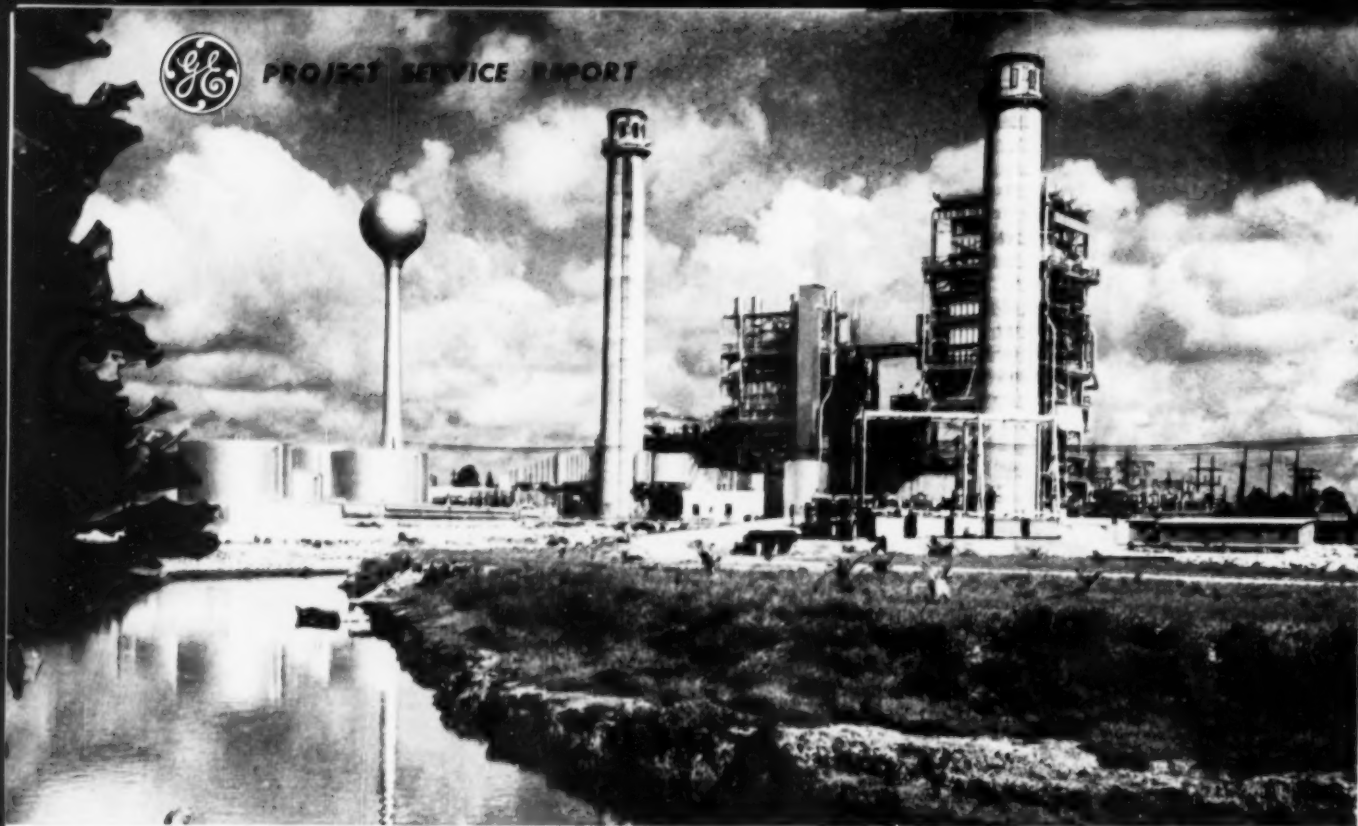
Boston New York Philadelphia Buffalo Washington Pittsburgh Cleveland Detroit Chicago Cincinnati Charlotte New Orleans  
Atlanta St. Louis Kansas City St. Paul Tulsa Houston Denver Salt Lake City Los Angeles San Francisco Portland Seattle



**COMPLETE STEAM GENERATING UNITS**  
AND FUEL BURNING EQUIPMENT FOR PUBLIC UTILITIES, INDUSTRIAL POWER AND HEATING PLANTS



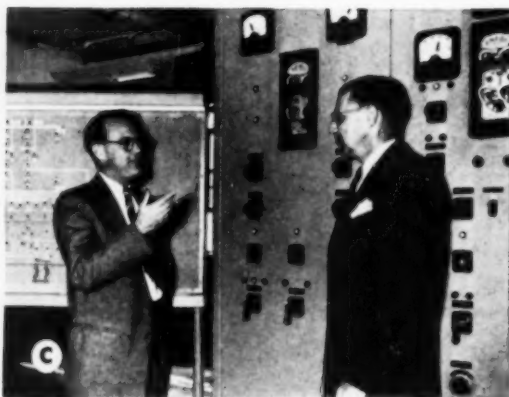
## PROJECT SERVICE REPORT



**TWO G-E TURBINE-GENERATORS PRODUCE 130,000 kw** at Cutler Station of Florida Power and Light Co., Miami, Fla., to handle rapidly increasing industrial and residential loads of this growing area.

Throughout construction, F. P. & L. and their consultants, Flasco Services, Inc., received consolidated project reports on manufacturing details and shipping dates of all major electrical equipment.

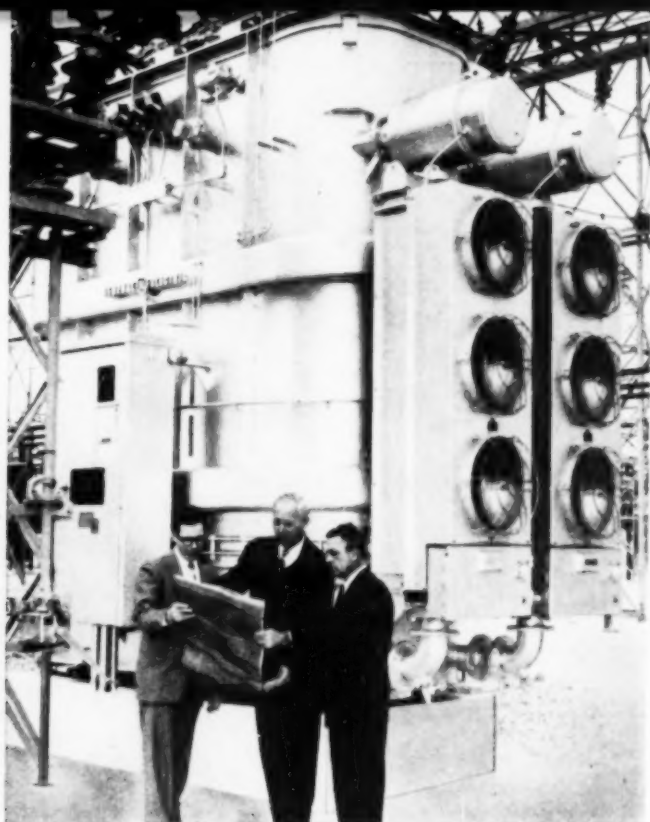
# General Electric helps Florida P.&L. keep



**A TURBINE-GENERATOR**, 80,000 kilowatts, the newest G-E unit at Cutler Station, is tandem-compound, double flow, 3600 rpm. Manufacturing time was kept to a minimum since early planning reserved factory space.

**B ADDITIONAL CAPACITY** is already on order for F. P. & L. to meet Florida's rapid growth. President R. H. Fite (center) of F. P. & L. discusses the installation of a new 135,000-kw G-E unit (going in service next year) with J. W. Lacy, G.E., and H. V. Street, F. P. & L.'s, Chief Engr.

**C SYSTEM REQUIREMENTS** are discussed by F. P. & L.'s H. W. Page (left), Manager Power Supply and George Kin-man, Vice President. Early planning with G-E Project Team helped F. P. & L. meet growing power requirements on time.



**MAIN POWER TRANSFORMER** is forced-oil air-cooled, 42,500 kva. L.H. Hill, Jr. (left), G-E Transformer Specialist, F.J. Peach, Station Supt. and J.W. Laey, Jr., G-E Office Manager, discuss time saved by upright shipment in one-piece tank.



**EBASCO SERVICES** confers in New York with G-E Sales Engineer W. Luxton. Left to right: F. A. Ritchings, Chief Mechanical Engineer, W. H. Colquhoun, Engineering Manager, Mr. Luxton, and H. L. Lowe, Chief Electrical Engineer.



**OUTDOOR SWITCHGEAR** connections are reviewed by E. A. Bird, Elasco Const. Supt., W. J. Blad, G-E Service Engineer, and Mr. Peach. Project Co-ordination greatly simplified scheduling of numerous components.

# ahead of growing power requirements

**Project co-ordination by G.E. on 80,000-kw addition to Florida Power and Light's Cutler Station proves planning, teamwork pay-off**

Cutler Station of Florida Power and Light, located near Miami, is an outstanding example of the utility industry's bold answer to the problem of sky-rocketing load growth in many areas. General Electric worked with F. P. & L. and its consulting engineers, Elasco Services, Inc., co-ordinating application engineering, product specifications, manufacturing and design cycles and scheduling of electrical equipment deliveries to help make sure the station went on the line on time.

In the expansion of this outdoor station, as in many stations throughout the country, Project Co-ordination has demonstrated its contributions to the planning, engineering, and successful operation of electric utility generating plants.

Such project co-ordination, combining the utility, the consultant and G.E.'s team of sales engineer, product specialists, application engineers and field service engineers, can save you time, money and man-hours. **Here's how:**

**SIMPLIFY ORDERING OF EQUIPMENT**, purchased either directly, or through your consulting engineers, or through a machinery manufacturer.

**CONSERVE ENGINEERING TIME** by co-ordinating mechanical details which frees you and your consulting engineers for other urgent problems.

**INTEGRATE EQUIPMENT DESIGN** to insure the maximum flexibility and effectiveness of plant operation.

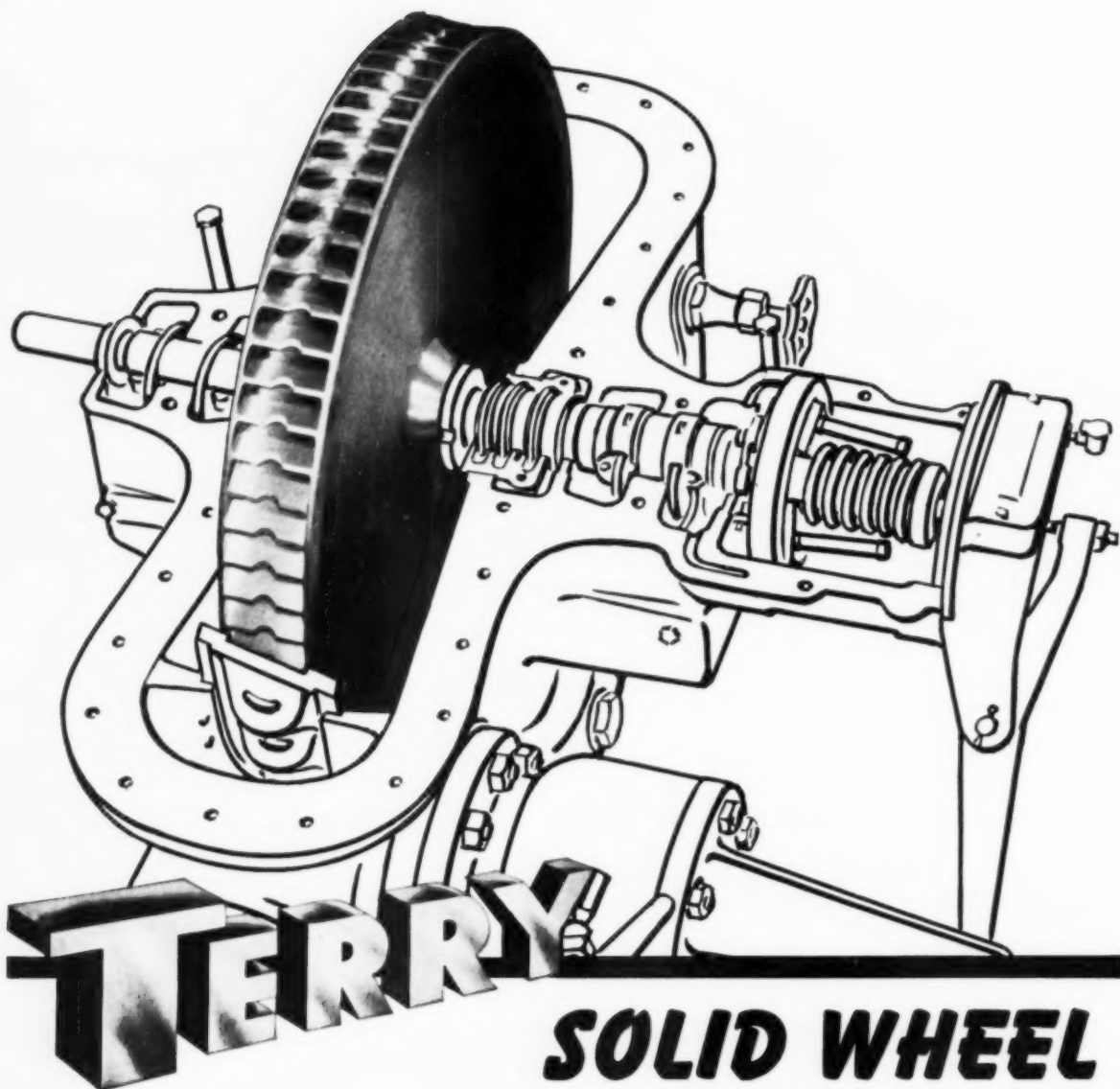
**SPEED CONSTRUCTION** by scheduling the arrival of equipment for maximum installation efficiency.

**SUPERVISE INSTALLATION AND HELP TRAIN OPERATORS** to insure minimum start-up time and better understanding of the full operating capabilities of the equipment.

For details contact your G-E representative, or write Section 302-5, Apparatus Sales Div., General Electric Co., Schenectady 5, N. Y.

**MORE POWER TO AMERICA**

**GENERAL**  **ELECTRIC**



## **SOLID WHEEL RUGGEDNESS** is your turbine dividend

The rugged construction and fool-proof design of a Terry solid-wheel turbine can save you money by keeping maintenance costs to a minimum. Usually only taken down for routine inspection, any repairs that must be made are of relatively simple nature, and cost of replacement parts is small.

The rotor of the turbine is a single forging of special composition steel, in which a series of semi-circular buckets is milled. There are no separate parts to loosen or work out. As the only function of the blades is to form a series of pockets, any wear which might occur would not materially affect

horsepower or efficiency.

It is impossible for the blades to foul. They have large clearances and are further protected by the projecting rims of the sides of the wheel. As the side clearances are also very large, end play can do no harm.

The Terry solid-wheel turbine is an extremely reliable piece of equipment—why not write for complete details today? Ask for a copy of Bulletin S-116.

**THE TERRY STEAM TURBINE COMPANY**  
TERRY SQUARE, HARTFORD 1, CONN.



# COSTS LESS BECAUSE IT LASTS LONGER

When you consider that the *true cost* of a piping installation is **INSTALLED COSTS** *plus* the cost of any **REPAIRS**, you can readily see why the proved, longer life of wrought iron pipe under various corrosive conditions adds up to real economy.

You'll get a good idea of how wrought iron pipe's durability has served and saved for others by reading over our bulletin, *Piping for Permanence*. We will be glad to send you a copy, or answer any specific inquiry that you might have concerning wrought iron in corrosive services.

A. M. Byers Company, Pittsburgh, Pa.  
Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N. Y.

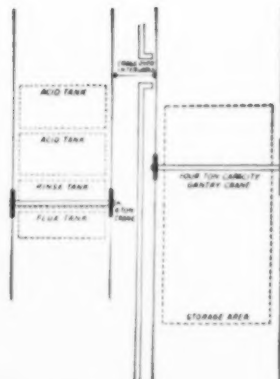
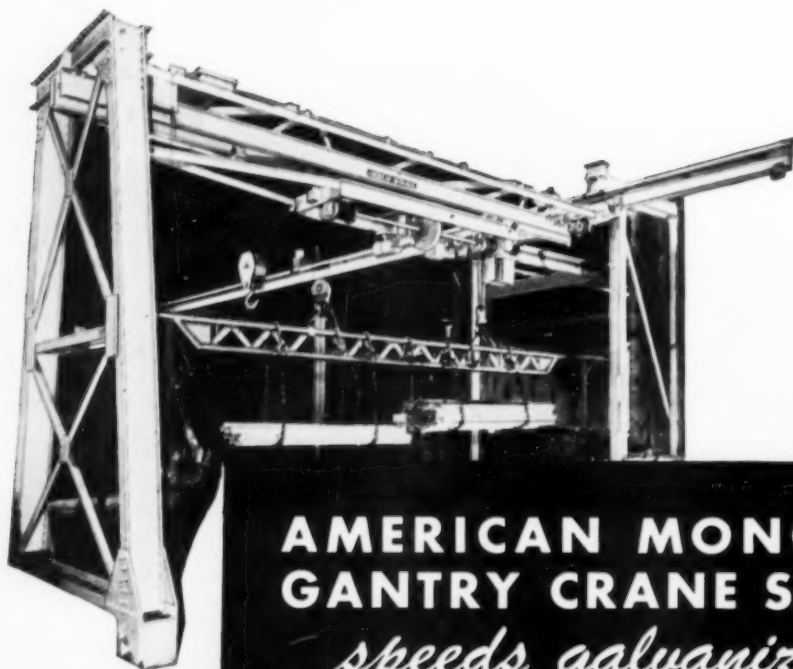


# BYERS

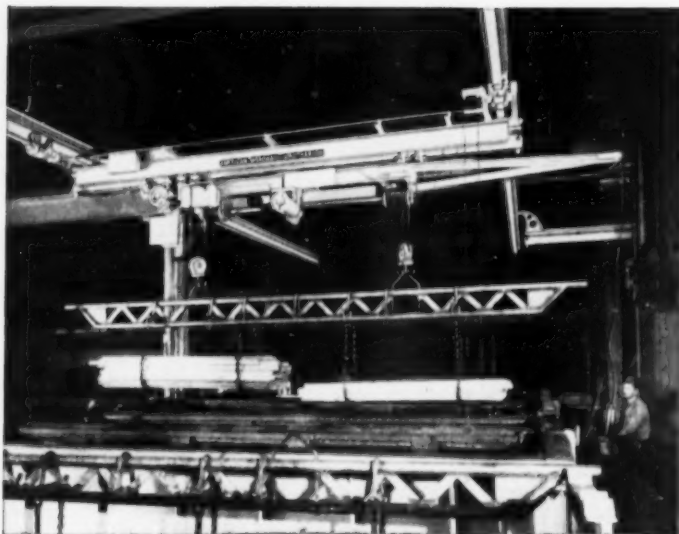
CORROSION COSTS YOU MORE THAN WROUGHT IRON

**WROUGHT IRON**  
TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY STEEL PRODUCTS



## AMERICAN MONORAIL GANTRY CRANE SYSTEM *speeds galvanizing!*



Steel fence posts travel from fabrication to galvanizing over a gantry bridge which interlocks at a crossover track through doorway for passage to the MonoRail crane serving the tanks in the plating room.

All travel on the 4-ton system is motor operated and controlled by push-button station in the operator's hand.

Here is truly team-work handling that results in cost savings as well as increased tonnage through the galvanizing process. It is a typical example of American MonoRail engineering available at no obligation for the solution of your handling problems.

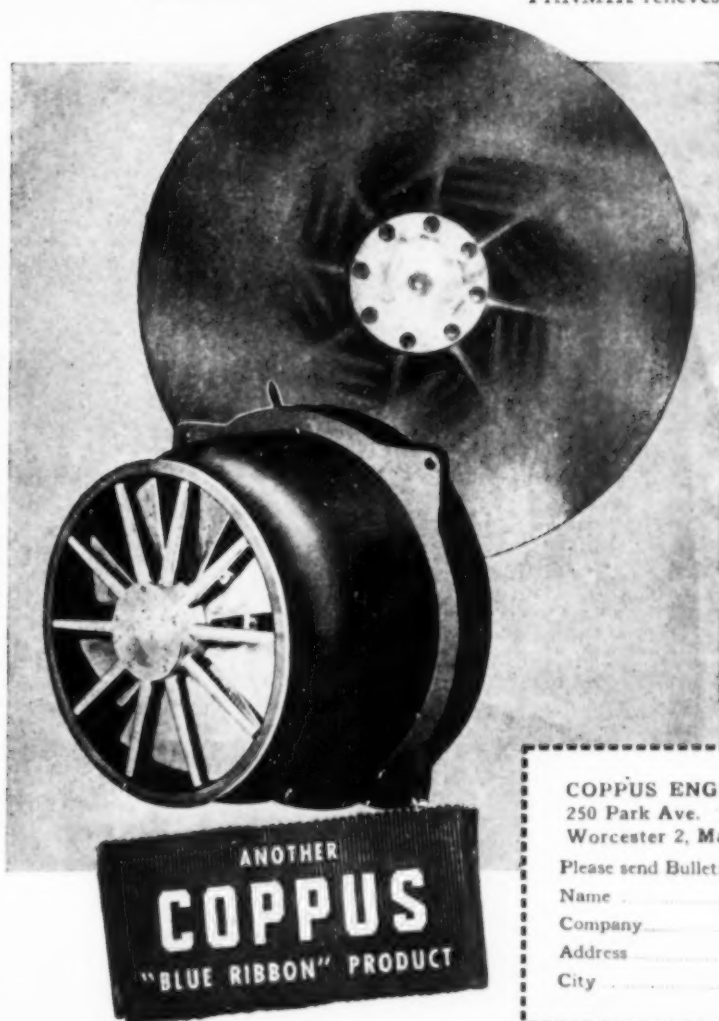
Send for Bulletin C-1 illustrating hundreds of successful MonoRail installations.



# MonoRail

COMPANY  
13105 ATHENS AVENUE • CLEVELAND 7, OHIO

*You get*  
**MORE**  
**CAPACITY**  
*with a*  
**FANMIX**  
**BURNER**



## Increase Boiler Ratings On Present Or Planned Equipment

In all types of Coppus-Dennis FANMIX Burners — straight gas or combination gas-oil — we utilize the energy of the fuel under pressure to drive the burner fan and deliver air in the proper proportion to the fuel flow. This exclusive "pinwheel action" *mechanically* mixes fuel and air in exactly the right proportions for truly radiant, non-luminous heat.

The result is uniform temperature everywhere in the combustion chamber — no drifting "hot spots" — and complete combustion under all conditions. That's why you can release more heat into your present furnace — why in new installations you get more heat into smaller furnace space.

### FANMIX Saves On Both Old and New Installations

FANMIX can easily be operated with your present furnace and stack, requiring only minor changes in other equipment. Or if you're planning on new boilers, remember that FANMIX relieves the furnace from the burden of mixing, creates its own forced draft and takes smaller pipe sizes. Which means you can plan on reduced combustion space, less stack, no forced draft equipment and lower installation costs all around.

### Get the Whole Story

Coppus engineers FANMIX Burners to meet individual requirements, providing complete control over heat pattern and combustion . . . Learn more about how "pinwheel action" can step up *your* boiler performance to peak efficiency and economy — as it is doing throughout industry. Send for Bulletin 410-6. Coppus Engineering Corp., Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other Coppus "Blue Ribbon" Products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, REFINERY CATALOG, and MINING CATALOGS.

COPPUS ENGINEERING CORP.  
 250 Park Ave.  
 Worcester 2, Mass.

Please send Bulletin 410-6 to:

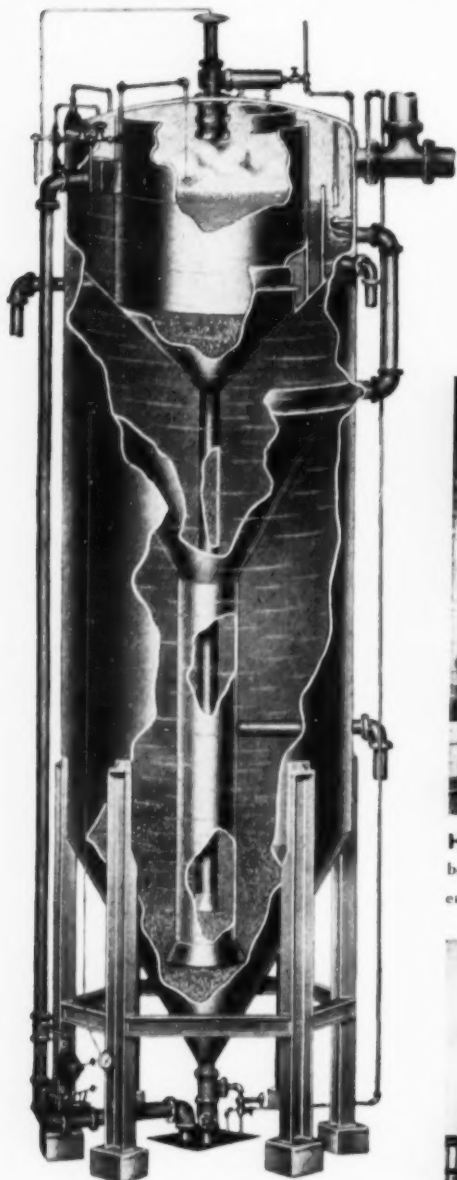
Name

Company

Address

City  Zone  State

# In Hot Process Softening, too BELCO Builds a Complete Line-

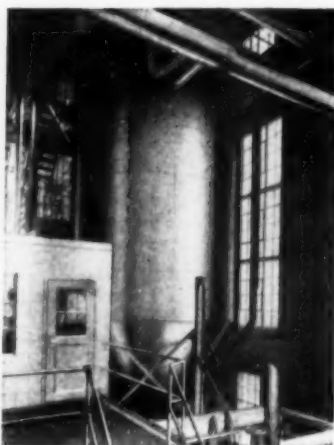


Illustrated literature "Belco In Pictures" is available on request. Write for copy, today.

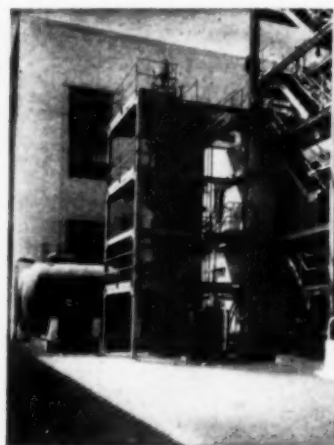
**Belco**  
*Processes for  
Removal of Water Impurities*

**BELCO DESIGNS. ENGINEERS & FABRICATES WATER PROCESSING EQUIPMENT**

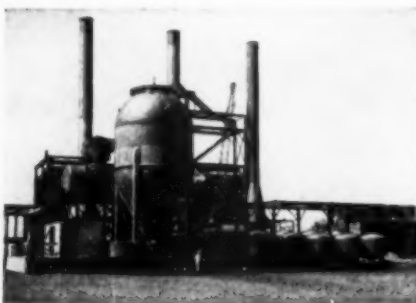
Belco-designed equipment provides high operating efficiency at low operating costs. Many of the country's largest industries rely on Belco for their water conditioning equipment. For example, Belco has built the largest fully automatic demineralization plant in the world and is currently furnishing one of the largest hot lime zeolite installations. A consultation with Belco could lead to lower operating costs for you, too. Write or call for technical assistance at any time.



**HOT LIME SODA** — Installation in boiler house at large eastern oil refinery. Has capacity of 200,000 lbs/hr.



**HOT LIME SODA** — Installation in large southwestern utility. One of three units with 90,000 lbs/hr total capacity.



**HOT LIME BELCOLITE** — Installation at large southern chemical company. Capacity 600,000 lbs/hr. This plant embodies "thoroughfare" operation of separate deaerator and hot process tank. The large hot process tank was designed, built and erected by Belco under its contract with customer.

Boiler Feedwater Heaters • Water Softeners • Filters • Clarators  
Demineralizers • Automatic Process Control Panels

**BELCO INDUSTRIAL EQUIPMENT DIVISION, INC.**

108 PENNSYLVANIA AVENUE, PATERSON 3, N. J.

REGIONAL OFFICES: Philadelphia, Pa., Chicago, Ill., Houston, Texas  
North Hollywood, Cal., Montreal, Que., Toronto, Ont.

Representatives in all principal cities of the United States and Canada

SOUTHERN POWER & INDUSTRY for OCTOBER, 1954



# Motorists: here's proof...

Gulf's cleaner-burning, super-refined gasoline solves today's No. 1 engine problem!



## Laboratory tests promised...

... these *immediate* and *lasting* benefits from this new, super-refined fuel:

**More complete** engine protection than from the so-called "miracle-additive" gasolines. Why? Because Gulf refines *out* the "dirty-burning tail-end" of gasoline (the No. 1 troublemaker in high-compression engines)—and then treats this new Super-Refined NO-NOX to give it a *complete range of protective properties*. It protects *every* part it touches against carbon, rust, gum.

**Extra gas mileage** in all your everyday, short-trip, stop-and-go driving.

**No knock, no pre-ignition.** Why? Because the anti-knock power of new Gulf NO-NOX has been stepped up to an all-time high.

**Stall-proof smoothness.** Instant *starts*, too—and fast, fuel-saving warm-up.

That's why new Super-Refined Gulf NO-NOX gives your engine more power-with-protection than you've ever known.

## Road tests proved...

These cars, powered by New Gulf No-Nox, actually performed better than new... after 15,000 miles!

True! After 15,000 miles per car—covering all conditions of city and country driving—Gulf test cars showed these results:

- Higher-than-new horsepower!
- Better-than-new on gasoline mileage!
- And not a single trace of carbon knock or pre-ignition at any time—even on the steepest mountain grades!



COMPLETELY NEW! SUPER-REFINED

# New Gulf No-Nox

THE HIGH-EFFICIENCY GASOLINE



**Nothing  
Succeeds  
like  
Success**



## **... Buell 'SF' Electric Precipitators PROVE IT AGAIN!**

**S**pectacular on-the-job performance started engineers talking... and it's been music to our ears ever since.

Our engineering friends have marvelled at low maintenance costs... at brand new efficiency records... at the wide range of different and complex dust recovery problems that are being solved by Buell's 'SF' Electric Precipitators.

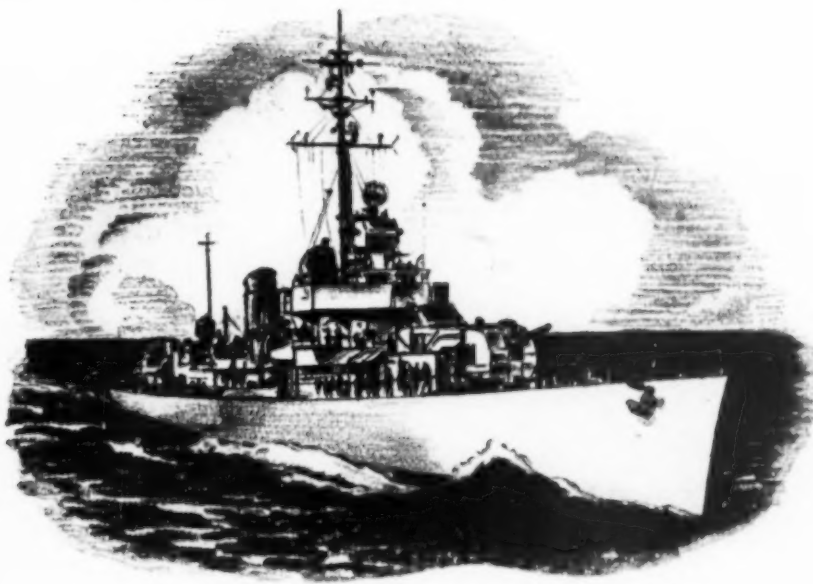
We will be happy to demonstrate the finer points at any time. Such standard Buell features as continuous rapping... convenient remote control from a central switchboard... the proved efficiency of the exclusive Buell Spiralectrode, are all elements of simple overall design.

Dozens of Buell 'SF' Electric Precipitators are already operating or in the works. Get the complete facts now. Write for our informative Brochure "The Collection and Recovery of Industrial Dusts" which tells about *all three* Buell Systems of industrial dust recovery. Write today! Buell Engineering Company, Department 80-J, 70 Pine St., New York 5, N. Y.

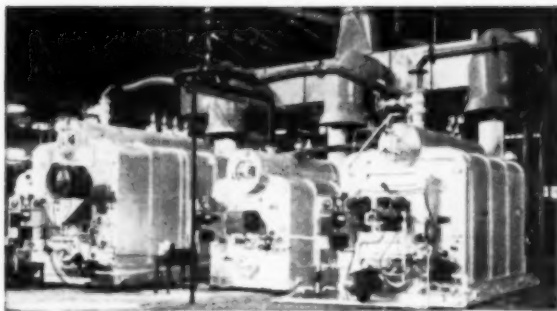
**buell**



*20 Years of Engineered Efficiency in*  
**DUST RECOVERY SYSTEMS**



## *"the Shakedown Cruise"*



Each KEYSTONE Steam Generator is **FACTORY FIRE TESTED** with the fuel and burner to be used

Before the United States Navy considers a ship as ready to take her place with the fleet, she is given a **shakedown** cruise. This cruise allows the Navy to check the ship from stem to stern and to make sure each working part is functioning properly. Exhaustive tests such as these assure the Navy that its ships can meet any emergency.

In our modern plant each Keystone Steam Generator is given a **shakedown** before it is consigned to your boiler room. The complete electrical circuit is checked to insure proper operation of all controls and the unit is then **FACTORY FIRE TESTED** with the specified fuel at the desired load conditions. Thus Erie City assures you of trouble free operation with your Keystone Steam Generator.

Erie City gives you a true package . . . boiler, burner, controls, draft equipment, all mounted, piped, wired . . . and **FACTORY FIRE TESTED**. Only basic field service connections are required to place your Keystone Steam Generator in operation. Every desirable advantage of modern power generation has been incorporated into the Keystone Steam Generator. Bulletin SB-51 gives a full description of the Keystone's many features.

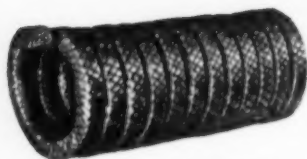
*You can depend on Erie City for sound engineering*

**ERIE CITY**  
119 Years in Steam Generation

**ERIE CITY IRON WORKS • Erie, Pa.**

STEAM GENERATORS • SUPERHEATERS • ECONOMIZERS • AIR PREHEATERS  
UNDERFEED AND SPREADER STOKERS • PULVERIZERS

## R/M's **BIG 7** Packing Types meet 95% of all packing needs



**TYPE 3**



High speed rotary compressors like this one which supplies pneumatic tools with 230 cubic feet of actual free air per minute—compressing it from atmosphere to 100 lbs. gage—give top performance with R/M Packing No. 920, a packing included in Type 3 of R/M's Big 7 Packing Types.

## With R/M you can practice P/M

By R/M we mean R/M packings. And by P/M we mean preventive maintenance. Hundreds of plants have already put an end to costly corrective maintenance by standardizing on R/M's Big 7 Packing Types. You can too. For this basic line of just seven field tested packings (you probably

need only three or four) is engineered to give custom-built performance in all but the very rarest applications. You can count on them to lower your inventories, reduce your downtime, cut your maintenance costs, and simplify your ordering. For details, call in your R/M distributor.

R/M PACKINGS FOR MAINTENANCE PURPOSES ARE SOLD ONLY THROUGH AUTHORIZED R/M DISTRIBUTORS



**RAYBESTOS-MANHATTAN, INC., PACKING DIVISION, MANHEIM, PA.**

# **BIG 7 PACKINGS**

**FACTORIES:** Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Passaic, N.J.; Neenah, Wis.; Crawfordsville, Ind.; Peterborough, Ontario, Canada.

RAYBESTOS-MANHATTAN, INC., Packings • Asbestos Textiles • Industrial Rubber, Engineered Plastic, and Sintered Metal Products • Abrasive and Diamond Wheels • Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Bowling Balls



How to make certain your pipe hanging jobs are

## RIGHT ON THE BEAM

EASY TO INSTALL  
AND ADJUST AFTER  
PIPE IS ERECTED

### THERE'S A STOCK GRINNELL HANGER FOR EVERY PIPING REQUIREMENT

With Grinnell Pipe Hangers you get better, stronger installations in less time. You not only save money on assembly—but on costly call-backs and maintenance, because Grinnell Hangers permit adjustment *after* pipe is erected. This makes it easy for you to correct sagging pipe, water traps . . . to provide positive drainage for the entire system.

Remember, there's a stock Grinnell hanger for every piping installation . . . from a simple water pipe to a high pressure, high temperature steam line. Where necessary, there are Grinnell engineered hangers to compensate for thermal movement.

Make sure your piping installations are *right on the beam*. Let Grinnell supply the correct hangers to meet all your needs. Grinnell hangers comply with piping code requirements.



## GRINNELL AMERICA'S #1 SUPPLIER OF PIPE HANGERS AND SUPPORTS



Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports  
Thermalier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

# Young at Heart After 38

## Crane valves policing main steam lines with no repairs—since 1916

### The Installation

In the Lehigh Portland Cement Co. plant at Oglesby, Ill. Original installation of 6- and 3-inch Crane steel valves in boiler-to-turbine steam piping. Working pressure: 160 pounds at about 475 deg. F.

### Valve Service Ratings

#### SUITABILITY:

**Hard to Beat**

#### MAINTENANCE COST:

**Not a penny for repairs**

#### SERVICE LIFE:

**38 yr.—still O. K.**

#### OPERATING RESULTS:

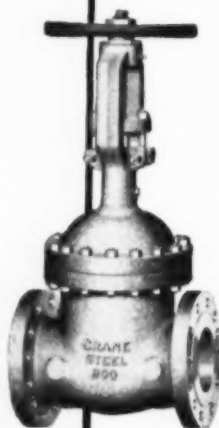
**Lowest cost steam control**

#### AVAILABILITY:

**Complete Crane line  
of modern patterns**

### The Valve

Like their 1916 counterpart designs, modern Crane Steel Valves give you performance that wins preference in every industry. They give you the values of steady leadership in steel casting... quality design... precise manufacturing. And the range of the Crane line in pressure classes, materials, and patterns, meets every need. See your No. 53 catalog, or your Crane Representative.



### The Case History

Never, since installed in 1916, have these Crane valves been out of service for repairs. Only care given—and good care, obviously—is prompt re-packing of the stuffing box and lubrication when needed. Such attention usually includes a general clean-up.

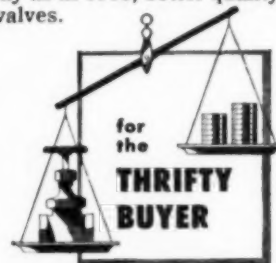
Neither infrequent operation nor the non-lubricating properties of steam have troubled these valves. They respond to the handwheel with smooth, positive action. High wear-resistance in seating materials keeps them tight as new, year after year.

Buying quality valves from the start assured this amazingly low-cost main line steam control. Today this buying policy is more justifiable than ever. And today as in 1916, better quality valves mean Crane valves.

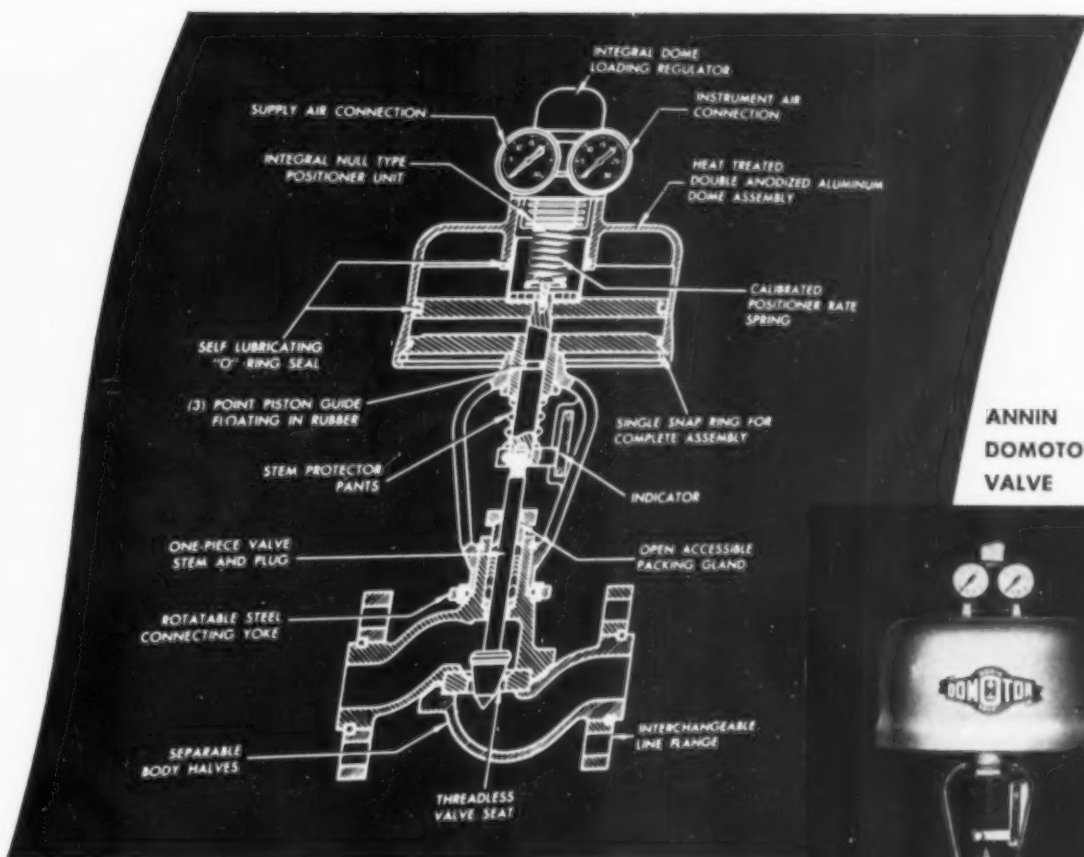
THE BETTER QUALITY... BIGGER VALUE LINE... IN BRASS, STEEL, IRON

# CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois  
Branches and Wholesalers Serving All Industrial Areas



VALVES • FITTINGS • PIPE • PLUMBING • HEATING



**ANNIN  
DOMOTOR  
VALVE**



## ~~GET~~ We want the Tough Jobs!

When precise control of hard-to-handle fluids is required, engineers and production men have learned from experience to depend on Annin Valves. Designed for long life, low maintenance, and efficient operation, Annin Valves are widely used to control erosive and corrosive fluids under a wide range of temperatures and pressures. Interchangeability of valve bodies, flanges, operators, and plug assemblies lowers the initial investment and cuts inventory requirements.



♦ **WRITE TODAY**  
for illustrated bulletin  
showing how and why  
Annin offers the best  
buy in control valves.

CUT  
INVENTORY

**50%**

WITH



**ANNIN** *Control*  
**VALVES**

**THE ANNIN COMPANY** 3500 Union Pacific Avenue  
Los Angeles 23, California

# Built to absorb

**OTIS HEAVY DUTY FREIGHT ELEVATORS**

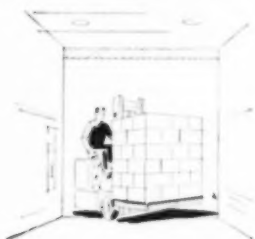




# "PUNISHMENT"

## ARE DESIGNED FOR POWER TRUCK LOADING

You've got to change your thinking about freight elevators — *when you change to industrial power truck loading!* A power truck, which may weigh 8,000 pounds or more, plus its heavy pay load, sets up unusually severe off-balance, extra static loading, and heavy impact forces in the elevator car and structure.

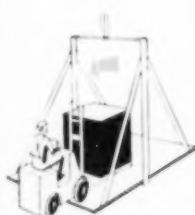


Let's examine this "punishment" in detail to see why an elevator for industrial power truck loading must be extremely rugged to stand up under these forces.

### Let's start with

#### ...OFF-BALANCE LOADING

As a power truck enters the car, it suddenly concentrates most of its weight and all of its pay load at the front edge of the platform. Then it usually deposits its



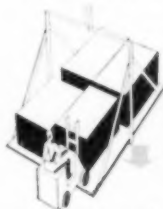
first heavy pay load at a rear corner of the platform.

This off-balance loading "punishment" is transmitted to the car, the rails and brackets, the elevator shaft, and finally to the building structure. All of these forces must be met with increased ruggedness of design.



### Now for

#### ...EXTRA STATIC LOADING



Watch the front wheels of a power truck as it deposits its final pay load. They usually stop at the front edge of the car platform. This adds up to 80% of the truck's weight to the load the elevator must withstand — which may be as high as 50% over the lifting capacity of the elevator.

This extra static loading "punishment" must be met with increased ruggedness of design.

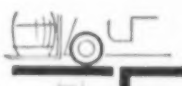
### Finally, there's

#### ...IMPACT LOADING

Industrial power trucks travel fast, stop quickly, and deliver freight with

heavy impact. They tend to tilt and twist the entire elevator structure with a variety of vertical and horizontal impact forces. See weight of the arrows in diagrams.

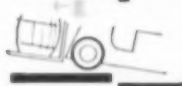
#### Platform Level With Landing



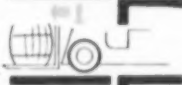
#### Platform Below Landing



#### Platform Above Landing



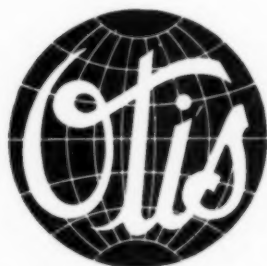
#### Fast Braking Stop



Impact "punishment" must be met with increased ruggedness of design. All of the forces described are at work, not singly, but simultaneously and in endless combinations.

Otis POW-R-TRUCK elevators with power-operated doors—and lifting capacities from 8,000 lbs. up—have the ruggedness of design, automatic controls, and traditional Otis safety needed for today's power truck loading. Write for Booklet B-705 or ask any of our 268 offices for details.

Otis Elevator Company  
260 11th Ave., New York 1, N. Y.



# FREIGHT ELEVATORS

HEAVY DUTY • GENERAL DUTY • LIGHT DUTY



Meet the man you can call  
with confidence to solve your  
thermal insulation problems



To insulate outdoor tanks with complete weather protection, these skilled J-M applicators follow a specification developed by Johns-Manville. Here they are fastening J-M Asbestocite® Sheets over J-M Zerolite® Insulation. J-M 85% Magnesia Insulation is also widely used for this type of equipment

He is your J-M Insulation Contractor... the man with  
the world's most complete insulation engineering service

"Insulation is no better than the man who applies it." Today, with rising fuel and maintenance costs, it is especially important to place your insulation job in skilled hands. The scientific application of J-M quality insulations by J-M Insulation Contractors will assure you of the maximum return on your insulation investment for years to come. Moreover, you get undivided responsibility for *all* your insulation requirements.

**1. You get dependable materials—** Johns-Manville manufactures a complete line of insulations for every service temperature from minus 400F to plus 3000F. From them your J-M Insu-

lation Contractor can select the right insulation for the most dependable service on your job. To develop new and improved insulation materials Johns-Manville maintains the J-M Research Center—largest laboratory of its kind in the world.

**2. You get dependable engineering—** For 95 years Johns-Manville has been accumulating insulation engineering experience. J-M Insulation Engineers are called upon to solve insulation problems of every type and magnitude, in every industry. Since your J-M Insulation Contractor works closely with J-M Insulation Engineers, he brings to *every* job a high degree of

training, skill and experience.

**3. You get dependable application—** Johns-Manville has set up a nationwide organization of J-M Insulation Contractors to serve you. These Contractors maintain staffs of insulation engineers as well as skilled mechanics thoroughly trained in J-M's proved application methods. You can have absolute confidence in their ability to apply J-M insulations correctly for trouble-free performance.

For further information and the name of your J-M Insulation Contractor, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont. **JM**

\*Reg. U. S. Pat. Off.

# Johns-Manville **FIRST IN INSULATION**

MATERIALS • ENGINEERING • APPLICATION



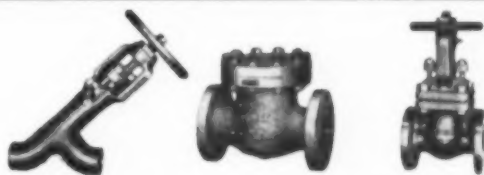
*"You see Powell Valves everywhere! And with . . .*

*. . . good reason! They're famous for dependability. Economical, too.  
What's more, Powell has a complete line."*

## Just name the valve needed...

... POWELL CAN SUPPLY IT! Small wonder—since Powell probably makes more kinds of valves and has solved more valve problems than any other organization in the world.

Available through distributors in principal cities. In bronze, iron, steel and corrosion resistant alloys.  $\frac{1}{8}$ " to 30" and 125 pounds to 2500 pounds W.S.P. On problems, write direct to The Wm. Powell Company, Cincinnati 22, Ohio.



CONTROLS FOR THE LIFE LINES OF INDUSTRY



# Powell Valves

*108th  
year*



Original Sunbury Steam Electric Station, built by Thomas A. Edison in 1883.

*from Edison's tiny Sunbury  
of 1883 to*

# SUNBURY TODAY

**a gigantic stride in electric light's sweeping progress**

*In providing only the most efficient  
steam generating equipment for the modern  
Sunbury Steam Electric Station of the  
Pennsylvania Power & Light Company,  
as well as for many other outstanding  
central stations, FOSTER WHEELER has made  
a significant contribution to*

LIGHT FOR FREEDOM



POWER FOR PROGRESS

**W**hen on July 4, 1883 Thomas Alva Edison closed the switch of the first three wire steam-electric station at Fourth and Vine Streets, Sunbury, Pa., the great inventor was initiating the public use of electric service. The sweeping progress that electric lighting was destined to accomplish in the years that followed is a tribute to Mr. Edison's genius and vision.

Today, located on the west bank of the Susquehanna, almost within view of the site of Edison's original building, stands its direct descendant — the mammoth Sunbury Steam Electric Station of the

Pennsylvania Power & Light Company. A striking example of the industry's rapid development, this modern plant's output assists in serving the home, farm, factory and community needs throughout an area of 10,000 square miles in Central Eastern Pennsylvania.

Six Foster Wheeler Steam Generators now serve turbines No. 1, 2, 3 and 4 totaling 425,000 kw capacity. When ultimately completed, Sunbury will have a capacity of more than 800,000 kw. Foster Wheeler Corporation, 165 Broadway, New York 6, New York.

## FOSTER



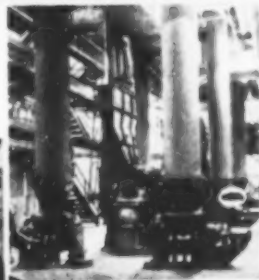
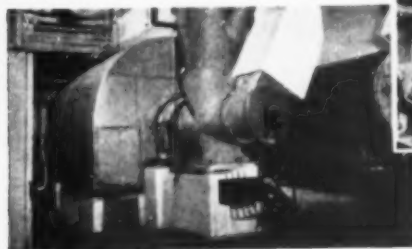
## WHEELER



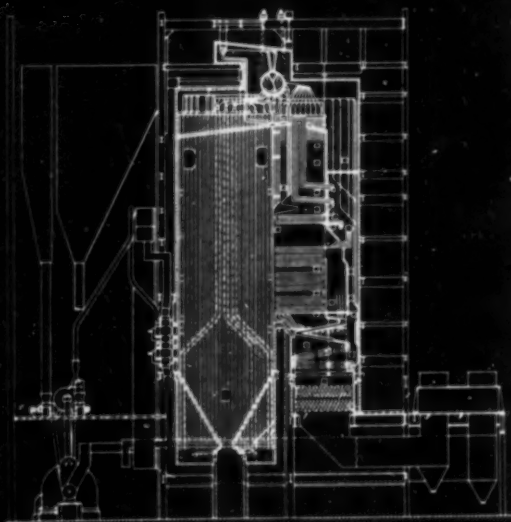


View, looking north, of the Sunbury Steam Electric Station of the Pennsylvania Power & Light Co., Sunbury, Pa. Ash disposal piping in foreground.

One of the Foster Wheeler ball mills, that pulverizes a mixture of anthracite and bituminous coal at the rate of approximately 21 tons per hr. Classifier with preheated-air inlet duct is in foreground.



Feeders and exhausters on the firing floor at Sunbury. These feeders are of the rotating table type, regulating the flow of anthracite and bituminous coal to ball-mill pulverizers.



Cross-section of 1,000,000 lb per hr reheat-type steam generator for 125,000 kw turbine generator Unit 4. Operating conditions: 1750 psig, 1005 F, reheat 1005 F. Fuel is pulverized anthracite and bituminous coal.



# Reliability

**ALWAYS PAYS OFF!**

In any business a reputation for reliability is a priceless asset, because buyers can't afford to gamble—they must be *sure*. And such a reputation doesn't come by accident . . . it must be earned!

Year in and year out for nearly three quarters of a century, Bell & Zoller has maintained a reputation as an outstanding producer of top-quality coals for every type of burning equipment. Buyers have long known that coal bearing the B & Z name is a "sure thing" for maximum boiler efficiency and top transfer of heat energy into steam power.

You, too, can put your chips on our 68-year reputation for reliable analysis, and delivery, of the *correct* coal to meet your specific requirements.



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CLEVELAND • NEW YORK • ST. LOUIS • MINNEAPOLIS • OMAHA  
MILWAUKEE • LOUISVILLE • TERRE HAUTE

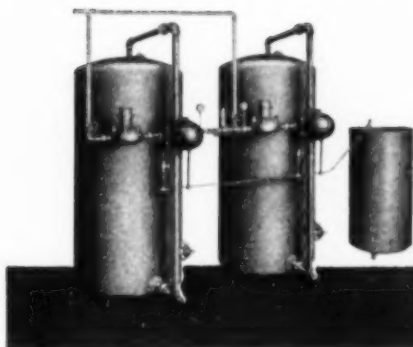
*Sixty-Eight Years of Service to Coal Users*

Producers of  
ZEIGLER, MOSS HILL,  
ORIOLE, MURDOCK,  
and BUCKHORN Coals

Sales Agents for

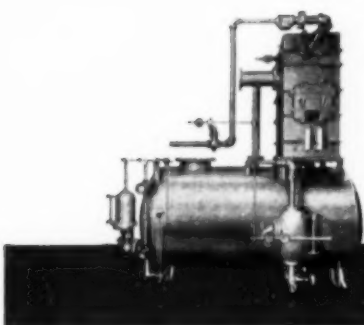
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# Designed to Prevent Boiler Scale and Corrosion *ECONOMICALLY*



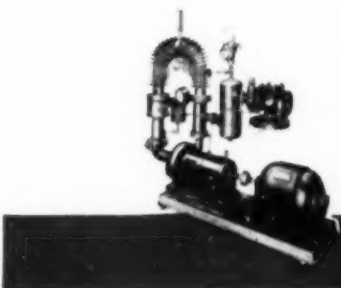
## COCHRANE ZEO-FLO ZEOLITE SOFTENER

Designed for small and medium size plants. Efficiently removes hardness and scale producing calcium and magnesium from water at low operating costs. Provides positive, accurate control of the softening and regeneration cycle. Simple to operate and install. No technical knowledge of the softening process or equipment is required. *Write for Publication 4505-A.*



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For small and medium size power plants. Delivers deaerated water with an oxygen content guaranteed not to exceed 0.005 c.c. per litre (less than 7 parts per billion)—generally recognized as zero oxygen! Factory assembled. Completely self-contained. Easy to install. Wide range of heater sections, storage tanks and accessories to meet practically any plant requirement. *Write for Publication 4643.*



## COCHRANE C-B CONDENSATE RETURN SYSTEM

Reduces steam cost to absolute minimum by direct return of condensate from process equipment to boiler at steam temperature.

Automatically eliminates entrained air from circuit.

Steps-up Latent Heat Transfer resulting in Increased Production—Better Product Quality, and Minimum Maintenance.

Several hundred installations in Package Boiler Plants such as Corrugating—Food—Laundry—Rubber—Chemical, etc.—**PROVE THIS!** *Write for Publication No. 3250.*



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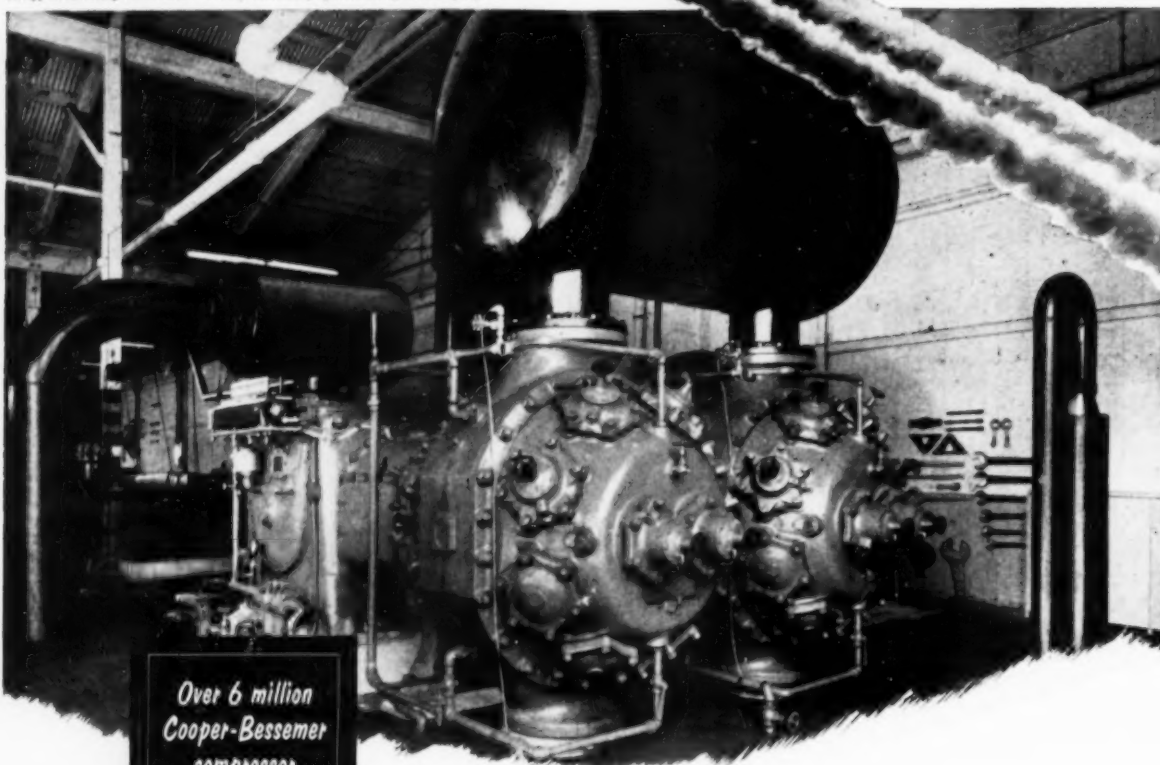
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Demineralizers • Hot Process Softeners • Hot Zeolite Softeners • Dealcalizers • Reactors • Deaerators • Continuous Blow-Off • C-B Systems • Specialties

Latest type Cooper-Bessemer 1500 hp opposed-action air compressor, installed in Boeing's Research Laboratory, Seattle. Capacity is automatically, accurately controlled at any discharge pressure up to 295 psig.



Over 6 million  
Cooper-Bessemer  
compressor  
horsepower  
NOW IN USE!



## Modern air power on land

**HELPS GAIN NEW POWER IN THE SKY!**

**H**ERE are two kinds of air power—Boeing's amazing new B-47 Stratojet, shown in a Jato takeoff, and a modern Cooper-Bessemer motor-driven air compressor. Installed in Boeing's Research Laboratory almost a year ago, this big compressor supplied air under pressure for testing many of the B-47 parts, will go on year after year contributing to Boeing's broad development program.

The latest Cooper-Bessemer compressor developments offer new advantages, new economies to plants everywhere . . . wherever air is a tool. For example, modern opposed-action design means greater space-saving compactness, vibration-free operation, higher efficiency, and longer life with less maintenance.

So when it comes to air or power, it will pay you to

write for the latest Cooper-Bessemer bulletins. Find out about the *new* things being done by one of America's oldest builders of engines and compressors.

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# CONTINENTAL Automatic Boiler

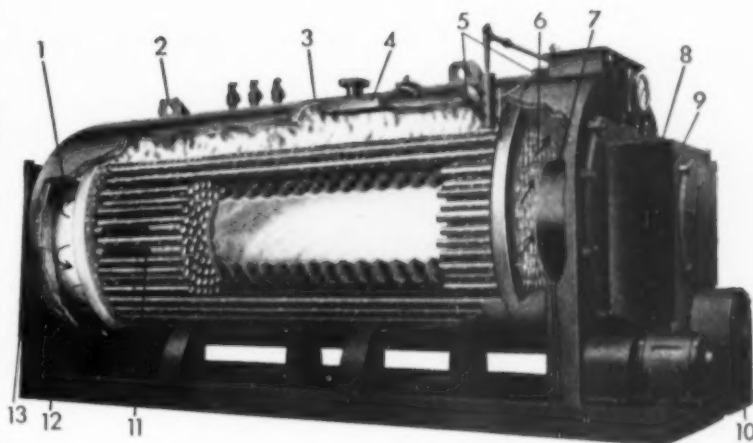
Manufactured by:  
**BOILER ENGINEERING & SUPPLY CO., INC.**  
Phoenixville, Pa.

- Two-pass design — simple and practical. Range 20 to 500 hp; 15 to 200 lbs. W.P.
- Factory tested before shipment. Guaranteed 80% efficiency.
- Spinning gas technique provides maximum radiant heat transfer from flame to water-cooled furnace walls.
- Even heat transfer — uniform flow of hot combustion gases through all return tubes. All tubes do the same amount of work, are subjected to the same temperatures, expand uniformly.
- Free and rapid water circulation keeps all heating surfaces clean; improves transfer of heat to boiler water.
- High CO<sub>2</sub> and low stack temperature — guaranteed not to exceed 125 F. above saturated steam temperature at operating pressure.

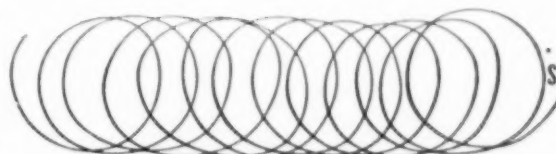
Write for Catalogs BE-3, BE-4

## Check these points when you select a boiler:

- (1) Fiberglass insulation with metal jacket and metallic paint finish.
- (2) Lift lugs for convenient handling on job site.
- (3) Boiler shell made of flange quality steel. All joints electrically welded. High pressure shells X-rayed to insure flawless construction and long life.
- (4) Separator to assure dry steam supply (99%+).
- (5) Dual low water cut-out to provide double insurance against dry firing.
- (6) Practical front-end construction that provides open flow of combustion gases to stack. No refractories to maintain. Entire burner front hinged, providing easy access to fire tubes.
- (7) Burner enclosed in furnace extension.
- (8) Burner and its vital parts — such as fuel nozzles, flame scanner and ignition assembly — fully enclosed in steel housing for safe operation.
- (9) Dual air-flow burner — for oil or gas fuels — precisely fitted to mix fuel and air for high combustion efficiency. Heat transferred directly to water surrounding the furnace.
- (10) Air for the burner passes through an inlet silencer to a forced draft fan. Air flow controlled by adjustable dampers.
- (11) Stationary alloy steel impeller in each return tube to impart spinning motion to hot gases.
- (12) Structural steel base distributes weight evenly on boiler room floor. No special foundation required.
- (13) Hinged rear door is lined with insulating refractory. Door can be opened in a few minutes — affording access to furnace and all return tubes. No need to remove and replace refractory baffles or brick work. Note sturdy hinge construction which insures positive seating of door.

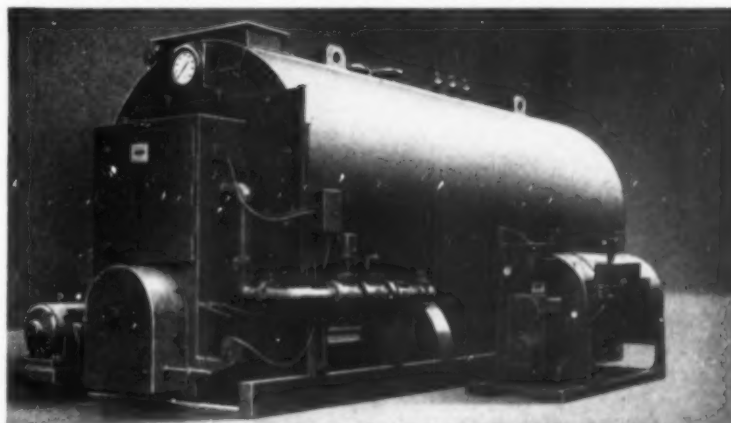


The CONTINENTAL Automatic Boiler



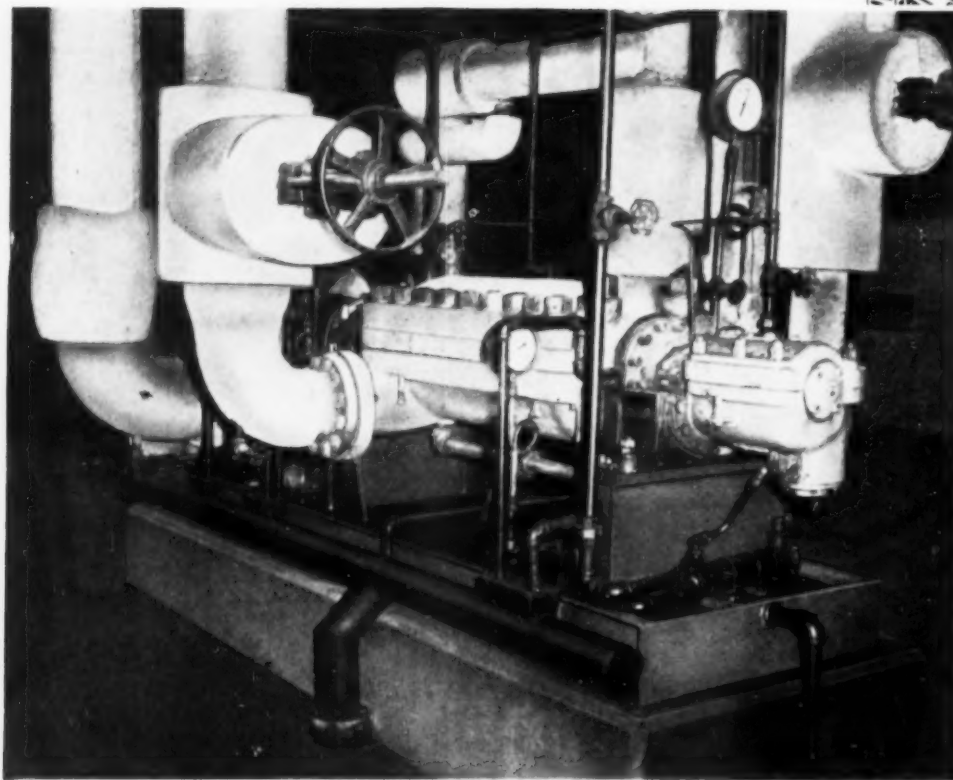
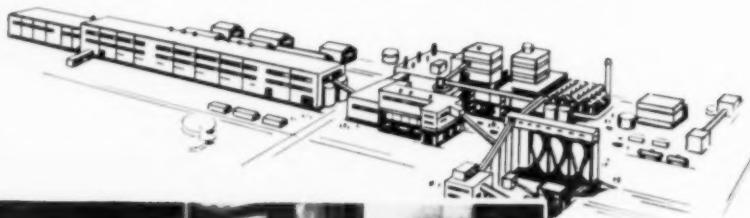
... the boiler with the  
Spinning Gas Technique

Sizes 20 to 500 hp. Pressures 15 to 200 lbs. W.P. Oil, Gas or Combination Fired.



# Ingersoll-Rand feed water pumps CHOSEN BY ST. REGIS PAPER COMPANY

for its new  
kraft paper mill



*Above, a line sketch of the new St. Regis kraft mill at Jacksonville, Florida. At the left, the I-R boiler feed pumps in the powerhouse.*

## Three HMTA 7-stage 400 gpm pumps serve the mill's boilers with 227°F feed water at 900 psi.

Another milestone in the long-range expansion program of the St. Regis Paper Company, this new kraft mill at Jacksonville, Florida is recognized as one of the most efficient operations in the industry. With a capacity of 100,000 tons of kraft paper and board annually, it was designed and constructed under the

supervision of the company's own engineers.

Three Ingersoll-Rand 7-stage feed water pumps, of the modern horizontally-split HMTA design with Unit-Type rotor assembly, serve the black liquor recovery, bark, and oil fired boilers. These boilers produce 429,000 lb/hr of steam at 625 psi

and 750F. Two of the pumps are driven by turbines and the third pump is motor driven.

I-R multi-stage HMTA pumps provide high sustained efficiency, flexibility of operation, reduced maintenance and other important advantages inherent in the Unit-Type rotor design. They are available for pressures to about 1400 psi, temperatures to 650F and capacities to 1600 gpm. For further details, consult your nearest I-R representative.

## Ingersoll-Rand

Cameron Pump Division  
11 Broadway, New York 4, N. Y.



980-TD

COMPRESSORS • CONDENSERS • AIR & ELECTRIC TOOLS • PUMPS • ROCK DRILLS • GAS & DIESEL ENGINES

**This MARLEY Cross-Flow has  
no secrets from the operator...**

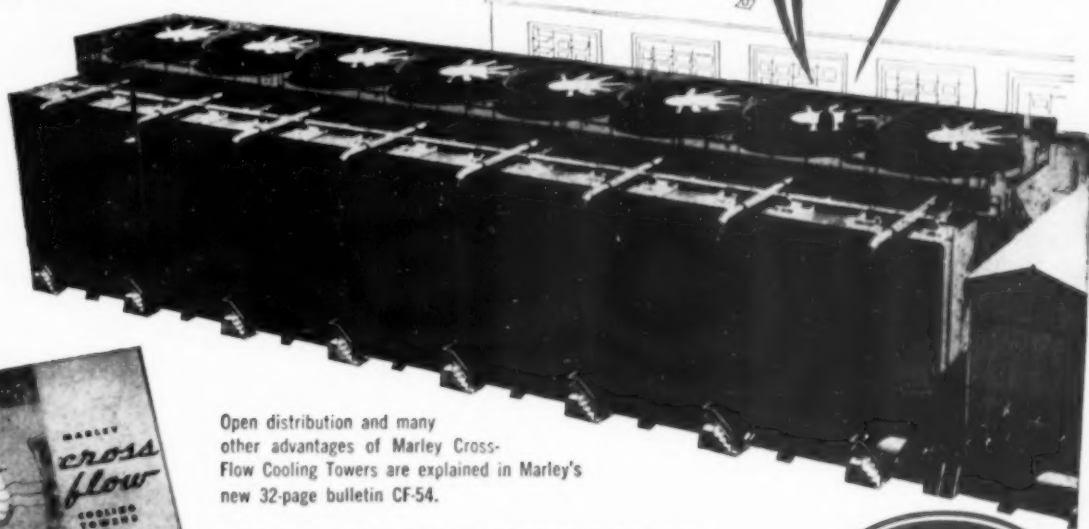
Open gravity distribution is one of the exclusive design features of Marley Cross-Flow cooling towers that makes them so "easy to live with" — and so economical to operate.

Is the water loading correct in every basin? Is the water flowing freely to every part of the tower fill? Are the basins clean? One glance and the operator of a Marley Cross-Flow has all the answers. And he takes that glance while making his inspection from a safe walkway. There is no need to subject himself to the hazards and discomfort of climbing into the tower to ascertain conditions.

If a change in water loading is desired, the valve is at hand and the variation in flow is visible. Since no pressure is required, increase or decrease in flow will not impair operating efficiency. No part of the fill will be starved; no part of the fill will be flooded.

Should a basin require cleaning, it is the work of minutes to shut down only the basin needing attention, clean it with complete safety and restore it to operation.

**... a single  
glance tells you  
where you stand!**



Open distribution and many other advantages of Marley Cross-Flow Cooling Towers are explained in Marley's new 32-page bulletin CF-54.

**WRITE FOR FREE COPY TODAY!**

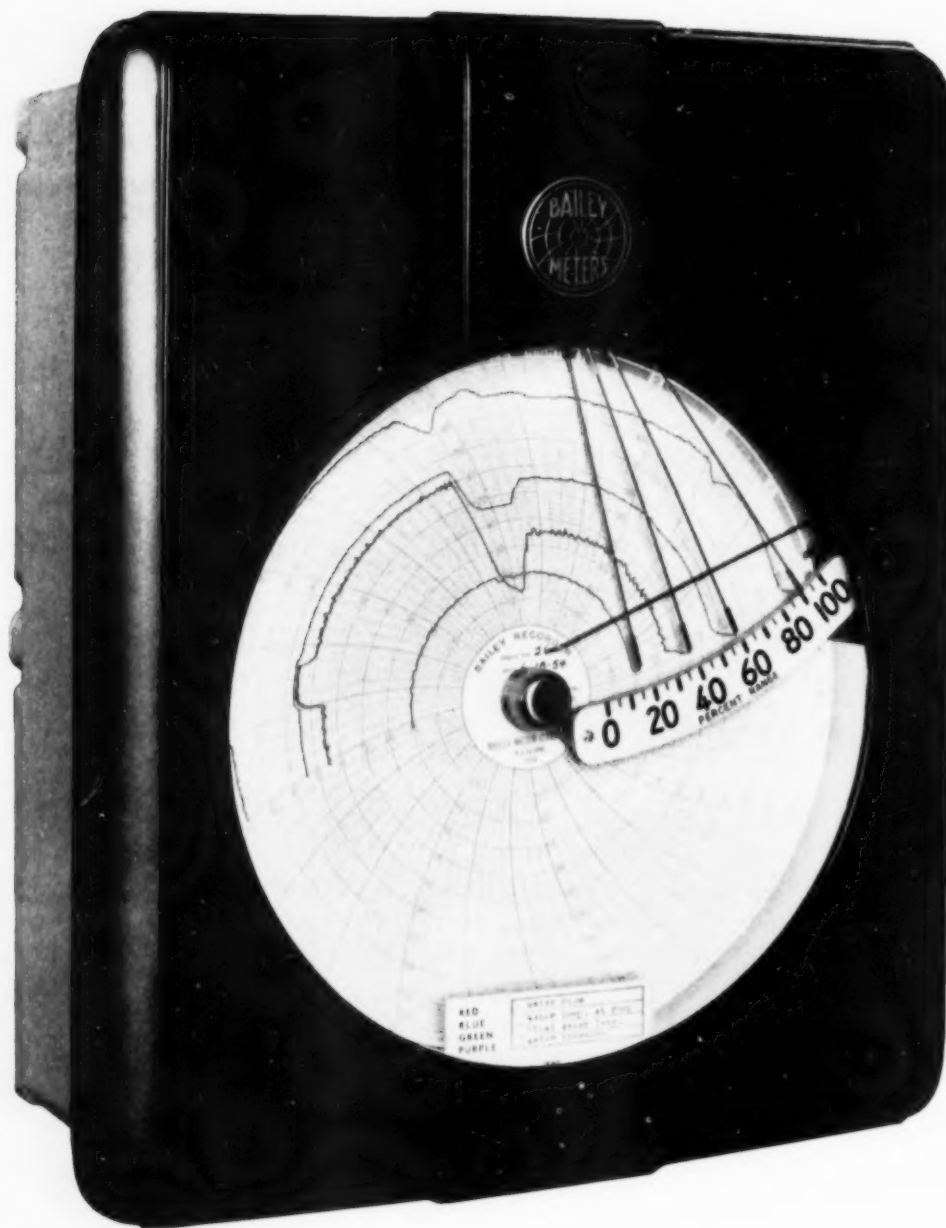
**The Marley Company**

Founder-Member Cooling Tower Institute

Kansas City, Missouri



# Announcing the New Bailey



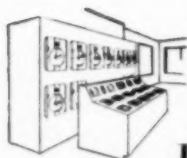
**The New Bailey Recorder provides continuous chart records of any four measured variables:**

% combustibles	density	flow	pH	ratio	speed
combustion	differential	liquid level	position	smoke density	temperature
conductivity	draft	% oxygen	pressure	specific gravity	vacuum



# Recorder for—

## Pneumatic and Electric Transmission Systems



Here is a panel-mounted recorder that offers new versatility never before available in a single instrument. Its unique interchangeable-unit design permits recording up to four measured variables, regardless of their nature or the location at which they are measured.

Individual plug-in type pneumatic or electronic receivers—and corresponding integrators—are interchangeable in the four identical frame-slots, permitting any combination of four pneumatic or electronic signal receivers, or any two receivers and their two integrators.

For the first time you can record four telemetered measurements on a single 12-inch circular chart—with a minimum of first cost and installation expense, and a maximum of operating economy. Low cost multi-purpose components permit fast and easy adaptation to new or changed process cycles.

### Check These Outstanding Advantages

**Extreme Flexibility of Application** is provided through the use of pre-calibrated plug-in type units—pneumatic or electronic—to record any measurable variables, in any combination. For example, you can “plug-in” pneumatic receivers along with electronic receivers to record up to a total of four variables on the same chart. Or your recorder casing can accommodate two integrators and their two corresponding recording receivers for rate of flow,

**Faster, Easier Servicing** of instruments is possible because of the new, sealed ink sacs and capillary pens. Under normal conditions ink sacs need be replaced only once each year. There is no day-to-day inking of pens.

**Faster, Easier Ordering from Stock** results from the unique standardized unit design. You can select any combination of recording receivers to fit your needs, by reference to simplified catalog specifications, and receive shipment without the delays ordinarily resulting from custom assembly. Complete interchangeability of plug-in type components simplifies stocking of spare units.

G34-2

Write for complete specifications—use handy coupon below



Plug-in type pneumatic receiver



Plug-in type integrator



Plug-in type electronic receiver

# BAILEY

## METER COMPANY

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*Controls for Power and Process*



COMBUSTION  
TEMPERATURE  
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GAS ANALYSIS  
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FLOW

Bailey Meter Company  
1028 Ivanhoe Rd., Cleveland 10, Ohio

Please send me product specifications on the new Bailey Recorder, as follows:

- ☐ With Pneumatic Receivers—Spec. P11-5  
☐ With Electronic and Pneumatic Receivers—Spec. E12-5

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Title \_\_\_\_\_  
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Street and Number \_\_\_\_\_  
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**O**UR FREIGHT TRAIN OPERATIONS, we mean. For we've speeded up most of Southern's scheduled freight service. It's now better than ever, and constantly being improved.

For example, our freight train No. 153 travels the route of our fine passenger train, "The Crescent," from Washington, D. C., to Atlanta, Ga., and its schedule is only 2 hours longer. Shippers save a day!

Many other stepped-up freight schedules now in operation benefit not only Southern Railway shippers but *you* as an individual, too.

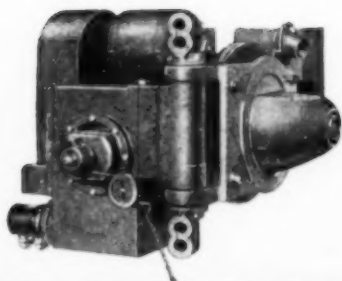
For even though you may never use it directly, the kind of mass transportation that serves your community can affect your home, your family, your job. Inadequate transportation is a drag on economic development. Good, dependable, all-weather service helps a locality prosper and grow. That's why aggressive, on-its-toes railroading like this is so important to the growing Southland. And to you!

*Harry A. DeBetta*  
President

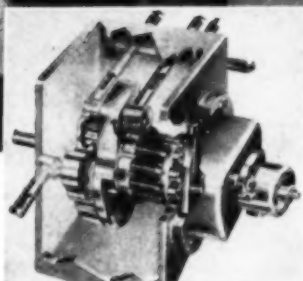
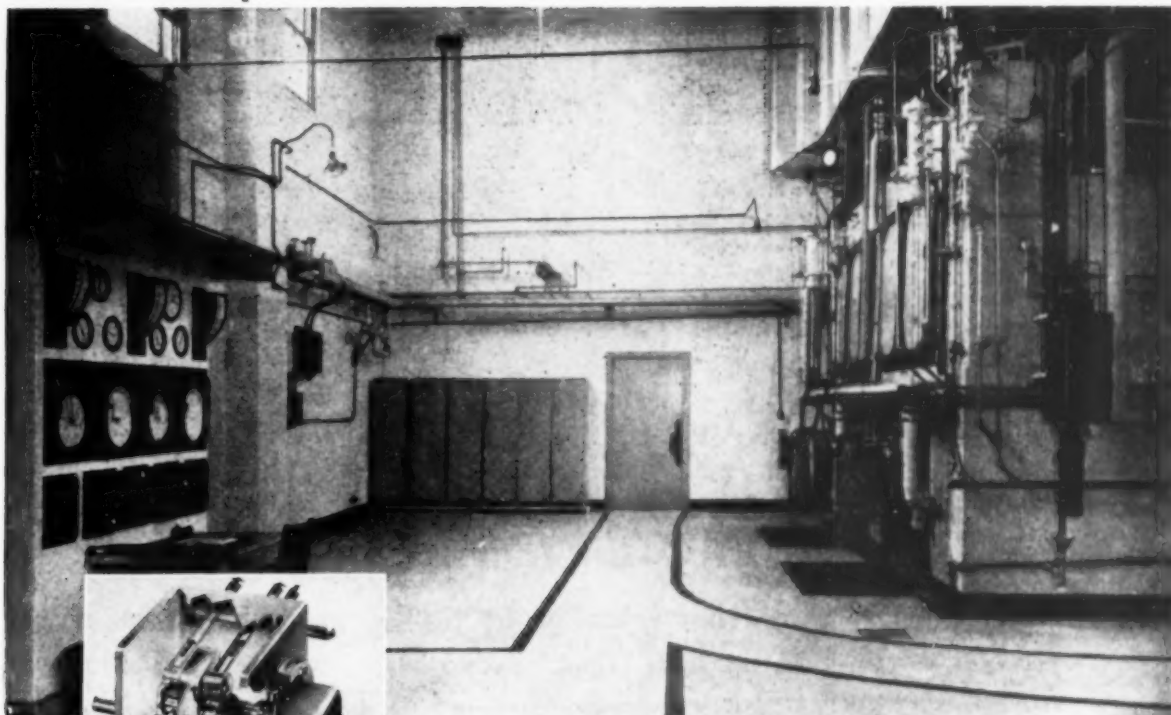


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WASHINGTON, D. C.



**Saving: \$3500 a year**  
**with Iron Fireman Rotary**  
**Oil Burners firing No. 6 oil**



**Fires any weight of oil  
 without special adjustment**

The Iron Fireman Oil Volumeter is a variable volume metering pump submerged in the oil reservoir. Oil feed rate is controlled with extreme accuracy (within  $\frac{1}{2}$  of 1% of setting) regardless of changes in oil viscosity. Oil is measured by volume, not by valves or ports.

**St. Therese's Hospital, Waukegan, Illinois reports on  
 Iron Fireman heavy oil burners after 4 years use.**

This fine boiler room is 100% automatic. Full modulating fire control provides the exact volume of steam required to meet the varied demands of a fluctuating load. No slow pick-up or wasteful over-firing. Sluggish heavy oils (No. 6) are regulated with extreme accuracy by the Iron Fireman Oil Volumeter (see picture at left).

Actual cash savings of \$3500 have been reported by Mr. George Juppe, Chief Engineer. About \$500 of this sum is attributed to savings in maintenance costs—an indication of Iron Fireman dependability.

"Our burners have proved very reliable over a wide range of operation," says Mr. Juppe. "Their high efficiency is not affected by variance in the quality and temperature of the fuel oil."

Send this coupon for more information, or see your Iron Fireman dealer.



**Iron<sup>®</sup>**  
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**AUTOMATIC FIRING FOR OIL, GAS, COAL**

**Iron Fireman Manufacturing Co.**  
 1053 W. 106th St., Cleveland 11, Ohio  
 In Canada: 80 Ward St., Toronto, Ontario

Please send detailed information on the Iron Fireman line of industrial burners for oil, gas, or oil-gas combination, including package burner units with forced or natural draft.

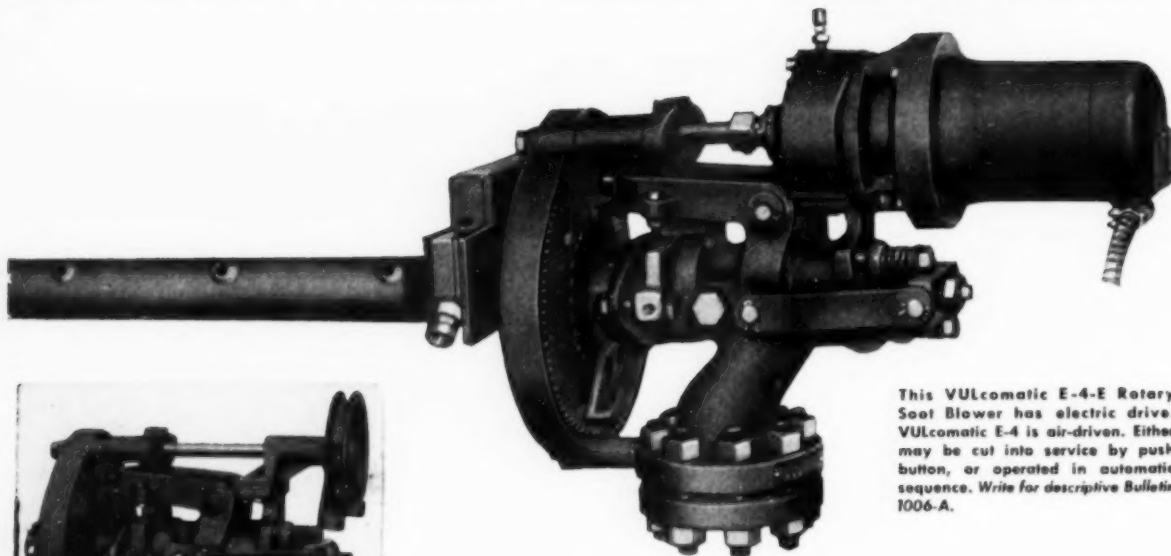
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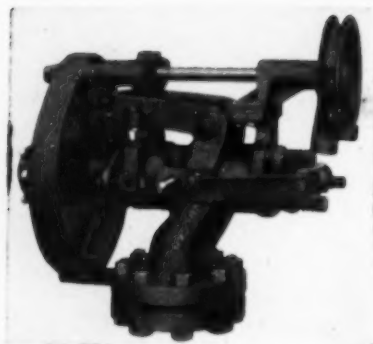
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# Here's the answer to SOOT and DUST REMOVAL



This VULcomatic E-4-E Rotary Soot Blower has electric drive. VULcomatic E-4 is air-driven. Either may be cut into service by push button, or operated in automatic sequence. Write for descriptive Bulletin 1006-A.



Manually-operated Vulcan P-3 is identical with VULcomatic E-4-E or E-4, except for drive. May be quickly converted to an automatic unit by replacing sheave wheel with air or electric motor. Bulletin 1005-A.

## MOTOR DRIVE or MANUAL

With Vulcan Rotary Soot Blowers, you get full cleaning pressure—from the crack of the valve to the end of the cycle. Exclusive trigger-action valve assures uniform speed of rotation for better cleaning, and closes automatically. While closed, it seals off corrosive furnace gases to protect internal parts. You can install Vulcan Rotaries at any angle. You can inspect or repair any part—with an ease that saves maintenance time and money.

## COPES-VULCAN DIVISION

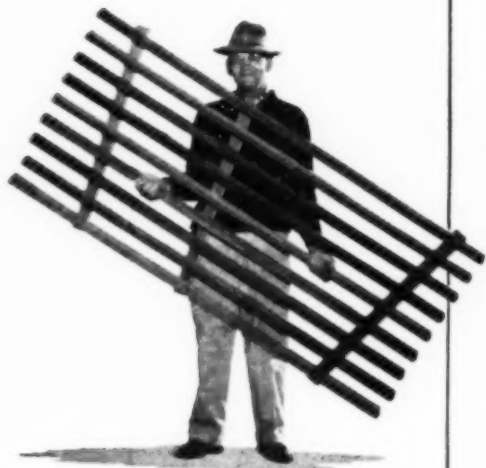
Continental Foundry & Machine Company  
ERIE 4, PA.

# VULCAN Rotary SOOT BLOWERS



# Examine the filling of a FLUOR COOLING TOWER

and get the whole story



## Fluor uses only 100% clear all heart redwood for filling

Fluor grid decks are not only sturdily built but are made from the highest grade redwood lumber — 100% clear all heart redwood — the finest cut of the log. Clear all heart redwood is free from defects and sapwood and under normal controlled water conditions will give many many years of trouble-free service. We invite you to investigate our filling before making your selection of a cooling tower.

On an average, the price of a cooling tower is based 30% on the mechanical equipment and about 70% for lumber and fabrication. For example, in a Cooling Tower costing \$200,000, the mechanical equipment will amount to approximately \$60,000 and the tower structure about \$140,000. Of this \$140,000 about 30% (or \$42,000) consists of the filling (grid decks) inside the tower which breaks up the water for greater exposure to air.

The filling is in reality the heart of the tower and its design and construction is of utmost importance. All Fluor Tower filling is mill cut and assembled into grid panels, 2 ft. 10" wide x 5 ft. 11 1/2" long. Nine bars are nailed (with 6 penny copper nails) to three 1 x 2 cross cleats. The bars are cut on a 25% bevel from 1 x 3 boards; each bar averages 1" x 1 1/2". Grid panels are strong enough to support three 200 lb. men and are actually used as scaffolding during tower erection and inspection. You get more years from a tower with this kind of filling.

Write for illustrated bulletin

"Cooling Water for Industry."



Grid decks easily support three 200 lb. men



Grid decks serve as scaffolding during erection



A 1x3 makes two bars for Fluor grid decks

BE SURE WITH

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THE FLUOR CORPORATION, LTD.  
LOS ANGELES 22, CALIFORNIA

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# Don't Split Responsibility



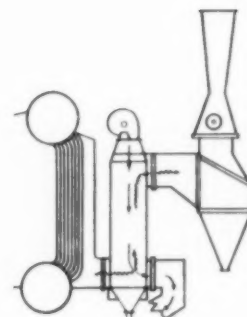
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P-D makes it easier, safer and quicker when you sign that order for steam generating auxiliary equipment. There's no time delay; no engineering problems; no piece-by-piece delivery from unreliable sources.

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POWER DIVISION: Tubular Dust Collectors, Forced Draft Fans, Air Preheaters, Induced Draft Fans, Fan Stacks

# Another New Installation of **SPRINGFIELD** Steam Generators...

New PLAINS ELECTRIC  
STATION  
Algodones, N. M.



"Our project supplies electric energy to eleven of the seventeen distribution cooperatives in the state of New Mexico and to one in southern Colorado," writes Norton Davis, Manager, PLAINS ELECTRIC GENERATION AND TRANSMISSION COOPERATIVE, INC. "This project was built with the primary idea in mind of supplying the much needed, economical electric power in the area served by our member distribution cooperatives. It, therefore, follows that a great deal of study was given to the selection of all major equipment with an eye to economy and reliability of operation."

Numerous ingenious and advanced features are incorporated in the design of the Springfield Steam Generators furnished for the new Algodones, N. M., plant. In addition to automatic superheater temperature control, provision is made for control of flue gas temperature above dew point in airheater on low loads. The steam washer is of Springfield patented design and all provisions are made for future spreader stoker firing with economizer and dust collector ahead of I.D. fan, if desired. As shown in the above photograph, the generators are placed so that the unit rear walls form a portion of the building wall.

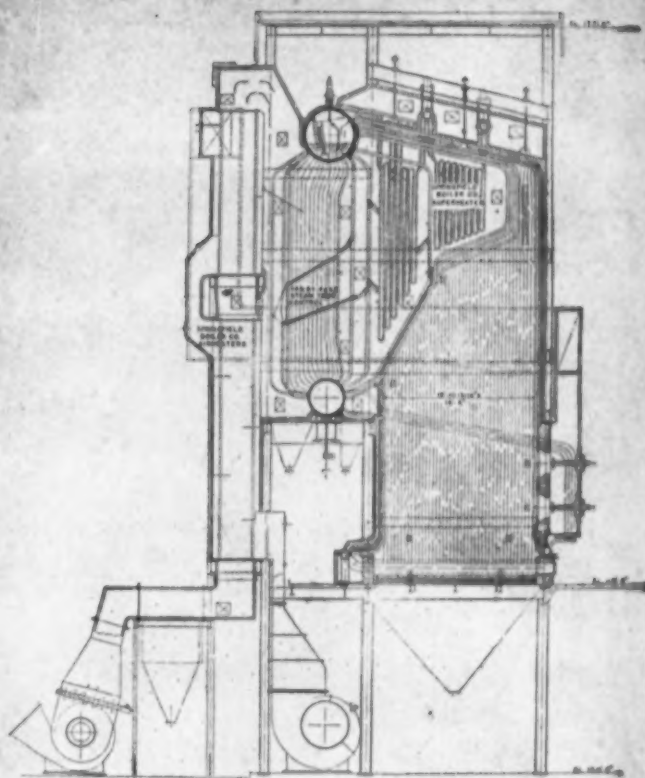
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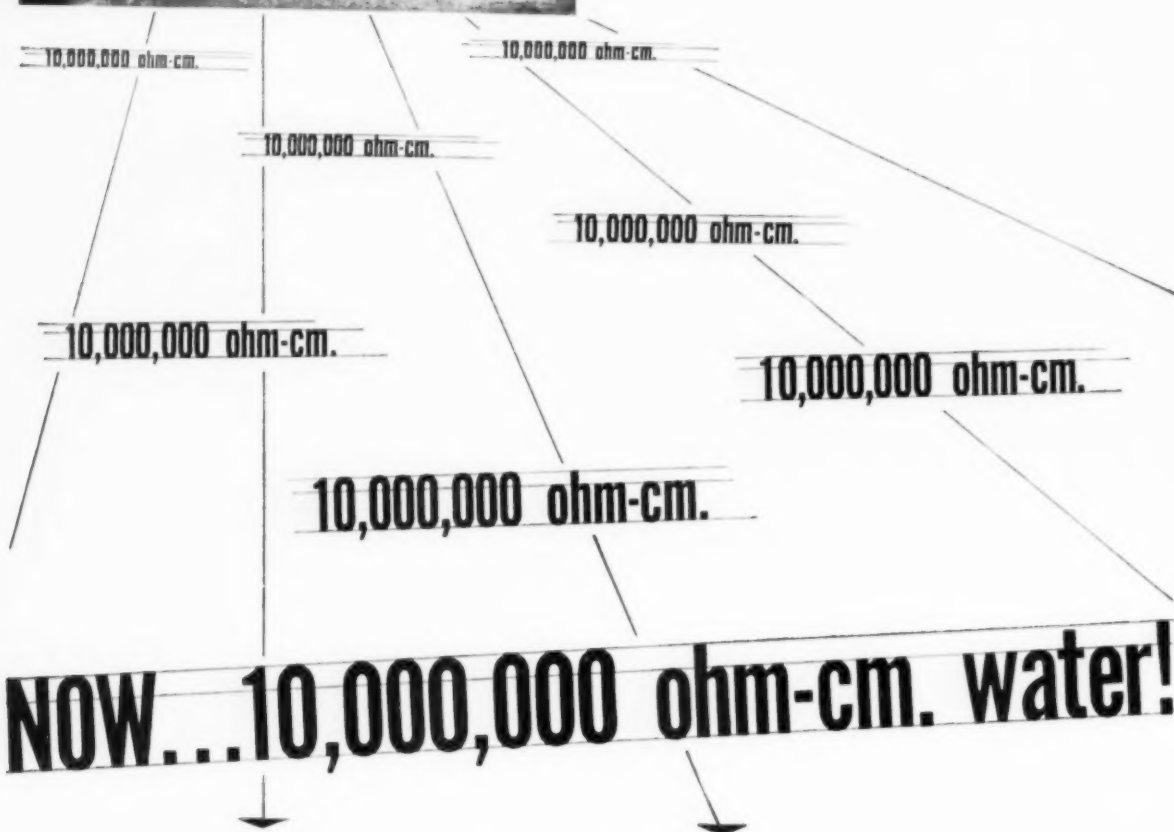
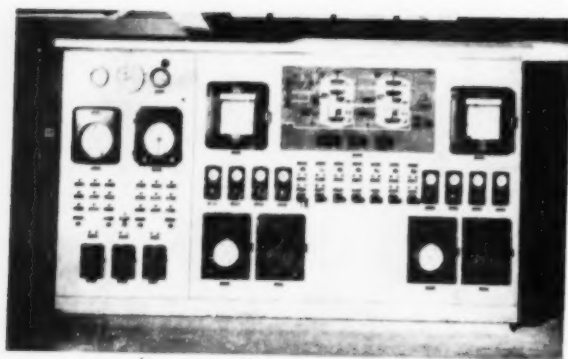
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Today, at the Pennsylvania Electric Company, Shawville Station, this has become a reality. Makeup for 2050 psig boilers is produced at a rate of up to 160 gpm and with a purity of 10,000,000 Ohm-cm (0.01 ppm) and **less than 0.02 ppm silica** by a fully automatic Graver Mixed-Bed Demineralizer with in-built dependability.

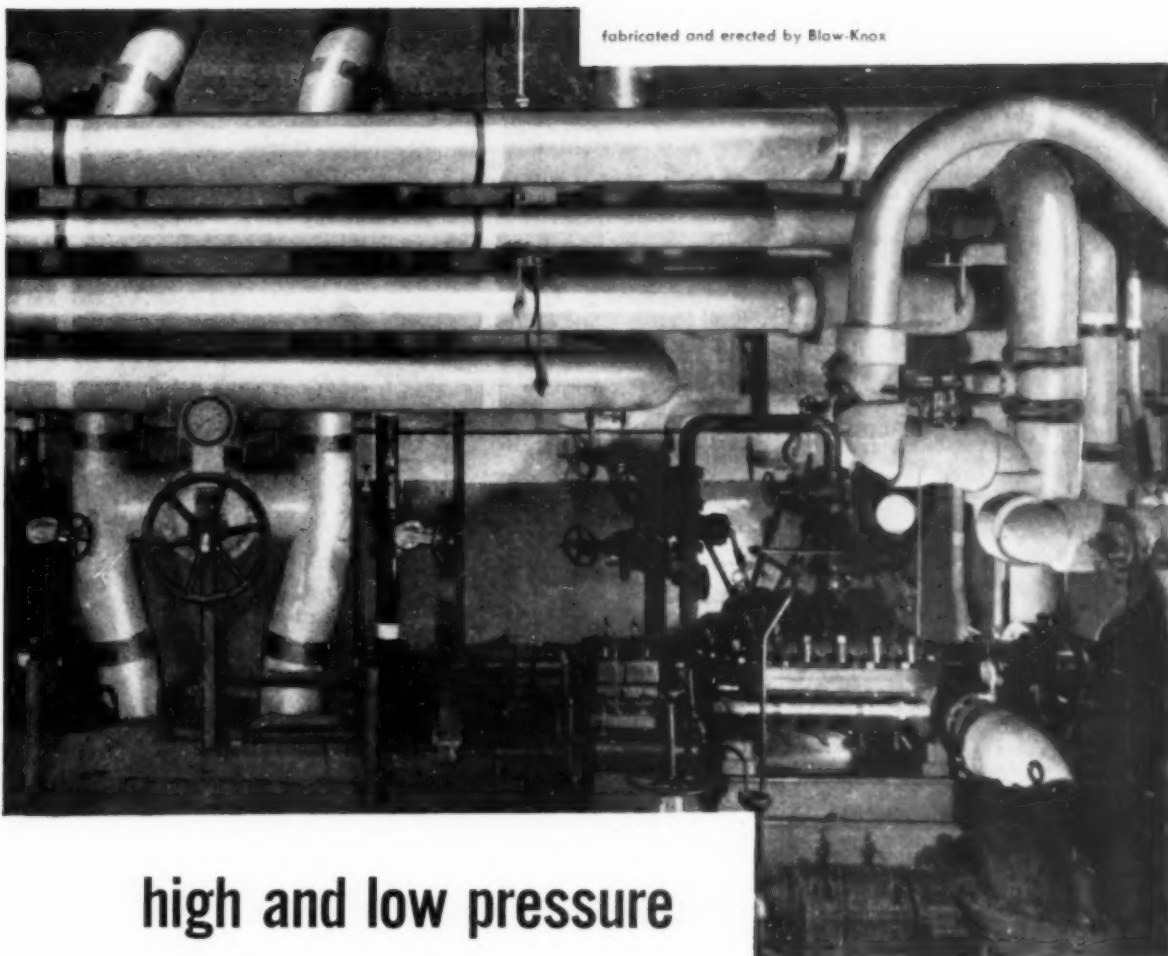
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When you need a piping system similar to this one . . . or a system for any pressure and any temperature requirements . . . you can readily obtain the benefit of our long experience in this field. We'll take the job from original engineering to final erection. Always in close cooperation, of course, with your consultants or your own organization.

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### BLAW-KNOX COMPANY

Power Piping and Sprinkler Division  
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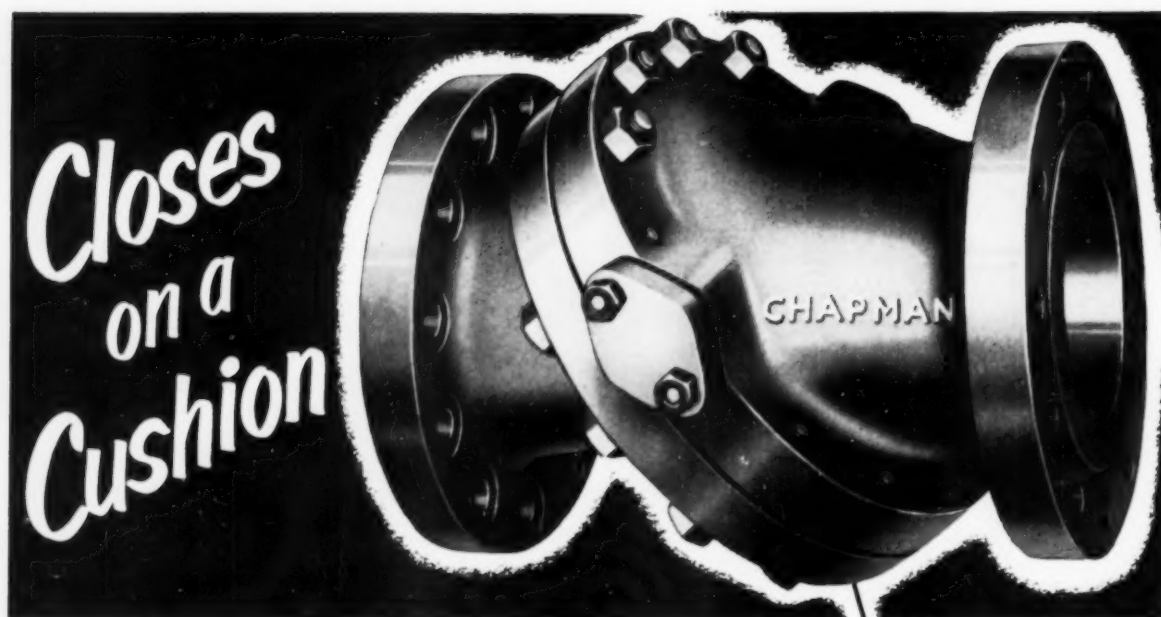
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Complete prefabricated power piping systems for all pressures and temperatures . . . plus complete line of functional spring hangers • rigid hanger assemblies • overhead roller assemblies • supports • vibration eliminators

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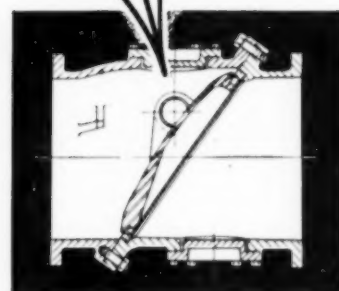


## ...for low cost, slam-free operation

Balanced pressures *cushion* the movement of the disc in Chapman's Tilting Disc Check Valve. The valve closes quickly but quietly, in all but unusual piping arrangements. There's no slamming to damage pipe-line joints or the valve itself. And *drop-tight* closure eliminates sliding wear on the disc and seat.

In the open position, the "airfoil" designed disc rides firmly against stops, without swinging or fluttering. That's why the hardened extra-large hinge pins give extremely long wear. And the absence of turbulence is one reason why head loss through Chapman's Tilting Disc Check Valve is lower than through any other type of check valve.

Low head loss, increased wear resistance and freedom from destructive slamming make Chapman's Tilting Disc Check Valves unbeatable for almost every installation. Write for Catalog No. 30 today.



### Here's why CHAPMAN Tilting Disc Check Valves Keep Quiet All Their Lives

This specially designed "airfoil" disc balances perfectly in open position . . . then drops easily to closed position (cushioned by the flow). No jarring or slamming, in usual pipe-layouts. Write for bulletin.

**THE CHAPMAN VALVE MANUFACTURING COMPANY**  
INDIAN ORCHARD, MASSACHUSETTS



# TIMELY COMMENTS



## PRODUCTIVE Maintenance Program NOW

By H. P. HAUCK

Manager  
General Electric Company  
Atlanta Service Shop  
Chamblee, Georgia

A COMMON practice in industry is to record all down time and charge the lost production to the department responsible for the outage. After repairs are completed, all the costs including production loss, idle time and the actual maintenance cost are computed and it is then that we realize just what the failure means. Investigations of this type show that increased mechanization and greater demands placed on old equipment are making properly scheduled, well organized maintenance programs imperative. They also show that the maintenance program must be productive in net dollars earned for the company. To be effective, the program should accomplish the following results:

- 1) Provide longer equipment life.
- 2) Give increased productivity.
- 3) Reduce production cost.

Over 11 billion dollars were spent for all types of maintenance in the United States in 1953—an increase of 44% over 1947 figures. Estimates indicate that is just one-half of what will be spent in 1964. Equipment costs, down time costs and production costs have increased even more. With the present trend toward increased mechanization and continuous processing, it is imperative that we recognize those machines that are indispensable and try to keep them in full production.

An example of the trend is indicated when we note that the Nela Park Lamp Plant of General Electric now produces 90,000 lamp bulbs per hour with 230 employees. In 1927 this same production would have required 75,000 men. In 1934 this was already reduced to 4,000 men and within the next 10 years, production is expected to be doubled with an increase of only



Fig. 1. Gather complete equipment data

28% in manpower. The President of the General Electric Company has recently forecast a production rate for the next 10 years which will produce the same amount of equipment that was produced in the past 75 years. With equipment of this type we cannot wait for a failure and "put out the fire" after it occurs.

While activity of other industrial operations may not parallel that of G-E, the trend is general. All types of industry must schedule maintenance programs to minimize the dollars lost—and do it now.

No one can predict all the breakdowns, but with intelligent maintenance planning, rush repair jobs can

*(Continued on page 71)*



Fig. 2. Establish extent of routine maintenance

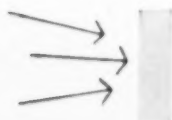
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SIZE**

**medium**

**or  
small**

## McALEAR STRAINERS meet the needs of all

■ When piping plans call for strainers, look to McAlear. Here's a line with the widest range ever . . . sizes from  $\frac{1}{2}$ " to 24". All types, too . . . flanged or screwed bodies . . . clamped or bolted covers . . . bodies of steel or special alloys and baskets of stainless steel, brass or monel . . . pressure ratings for all services. McAlear Strainers supply positive protection against grit and scale . . . cut pipe line repair costs . . . insure efficient operation.



**IF IT'S McALEAR EQUIPPED  
IT'S UNDER SAFE CONTROL**



*Here's McAlear King Size Style 528 Strainer for hydraulic service . . . body, cast steel . . . 1200 lbs. working pressure . . . baskets, stainless steel . . . size, 24" . . . weight, 10,000 lbs.*



*Style 530—flanged ends  
Cast Iron:  $1\frac{1}{4}$ " to 10" inclusive  
Cast Steel:  $1\frac{1}{2}$ " to 10" inclusive*

*Style M510—Screwed Ends  
With Mesh Basket  
 $\frac{1}{4}$ " to 4" sizes*



**McALEAR MANUFACTURING COMPANY**  
1901-1919 South Western Avenue  
Chicago 8, Illinois

## Timely Comments (Continued)

be greatly reduced. We would like to suggest the following five steps to help you set up your *Productive Maintenance Plan*.

### Step 1—Gather Complete Equipment Data

Productive Maintenance begins with an inventory of all plant equipment, so you can know what you have and where it is. To properly identify each unit, an inventory number is assigned, usually indicating the building, floor, and machine. The number is put on the equipment or machine in a prominent place. You can simplify your equipment inventory by using record sheets or cards listing general data desired, and the special information you need.

### Step 2—Determining Extent of Routine Maintenance

This means deciding how much care your equipment warrants. Non-critical equipment, such as the air conditioning motor (Fig. 2), may not need to be included in your special Productive Maintenance plan. Your objective here is to determine not the greatest, but the most desirable amount of maintenance. Include only those items where Productive Maintenance will pay, or help make workers safe. Anybody can do a complete maintenance job—but that is unnecessarily expensive.

### Step 3—Establish a Routine Operating Control System

Based on an analysis of reports, you can then establish schedules for routine work such as motor lubrication. This forms, in effect, a routine operating control system. Ideally, your inspection cycle should strike a balance between "too often," with resultant waste of money, and "not often enough," with the possible damaging outages that can occur.

EVALUATION OF PLANNED OVERHAUL REQUIREMENTS			
LOCATION _____		DATE _____	
DEPARTMENT _____		MACHINE NO. _____	
MACHINE RATING _____			
AGE SINCE INSTALLATION OR LATEST OVERHAUL _____			
OPERATING CONDITIONS (ATMOSPHERE TEMPERATURE) _____			
HOURS OPERATION PER DAY _____			
ELECTRICAL CONDITION READING: _____			
CONDITION OF INSULATION _____			
MECHANICAL CONDITION _____			
POSSIBLE RETIREMENT OR REPLACEMENT OF MACHINE _____			
PRODUCTION TIME LOST FOR PLANNED OVERHAUL _____ DAYS	TOTAL DOWN TIME COST \$ _____	COST OF PLANNED OVERHAUL \$ _____	TOTAL PLANNED OVERHAUL COST \$ _____
PRODUCTION TIME LOST IN EVENT OF MAJOR FAILURE _____ DAYS	TOTAL DOWN TIME COST \$ _____	COST OF REPAIR & PARTS \$ _____	TOTAL FAILURE COST \$ _____

Fig. 4. Planned overhaul evaluation system



Fig. 3. Establish routine operating control system

### Step 4—Evaluate for Critical Maintenance

This is determined in two phases: (1) Evaluation of planned overhaul requirements and, (2) Evaluation of critical parts protection requirements. Shown in Fig. 4 is the form for evaluation of planned overhaul requirements. Close cooperation between production and maintenance departments is necessary in this step. Together, these two groups must evaluate the functional importance and duty cycles of all electrical equipment in the Productive Maintenance program.

The second part of step 4, in evaluating for critical maintenance, is evaluation of critical parts protection requirements. This evaluation is based on the failure of a part which requires the longest repair time such as armature coils (see Fig. 5).

### Step 5—Establish a Critical Maintenance Program

This should include determining the probable retirement or replacement date of every piece of critical equipment. Such critical equipment requires a rigid schedule of inspection and maintenance. Planned, short-term outages for maintenance or replacement of this critical equipment consume far less time than shutdowns which otherwise might occur. As a result, the gap between actual and theoretical maximum production on the part of a machine is narrowed.

EVALUATION OF CRITICAL PARTS PROTECTION REQUIREMENTS				
(The Evaluation is based on the failure of a part which requires the longest repair time such as armature coils)				
	NO MAJOR PARTS STOCKED	ARMATURE COILS STOCKED	COMPLETE ARMATURE STOCKED	COMPLETE MACHINE STOCKED
REPAIR TIME	10 days to make coils	6 days to rewind armature	7 hours to install new armature	3 hours to replace motor
TOTAL DOWNTIME COST	\$165,000	\$100,500	\$4,900	\$2,100
COST OF PARTS PROTECTION	0	Coils \$4,664	Armature: \$25,600	Motor: \$46,000
COST OF REPAIR	\$12,730	\$5,900	Installation: \$850	Installation: \$360
TOTAL FAILURE COST	\$180,730	\$111,364	<b>\$31,350*</b>	\$48,460*
*Add disassembly Assembly and Transportation *Add Repair Cost straight Time				

Fig. 5 Critical parts protection evaluation

# BORDEN

*First* IN FLOOR GRATING

## 1 ENGINEERING

When special designs or details are wanted, Borden's engineering department is ready to assist with recommendations and drawings.

## 2 MANUFACTURING

Borden Floor Gratings are manufactured exclusively in Borden plants. A Borden grating is a manufactured unit rather than an assembly of various parts from different sources. Plants with complete stocks of materials and fabricating facilities, strategically located, assure fast, uninterrupted installations.

## 3 INSTALLATION

Tailored-to-fit installations, factory-made to blueprint as far as possible, eliminate delays and speed erection on the premises. Many unsolicited complimentary letters from owners and contractors in all types of industries attest Borden's ability to prepare floor grating installations which avoid costly field corrections.

## 4 SERVICE

Borden makes available a continent-wide service by maintaining representatives in most of the principal cities of the United States. It is possible to get competent Borden service anywhere in the country within a reasonable length of time.

*this is the*

**BORDEN METAL PRODUCTS COMPANY**

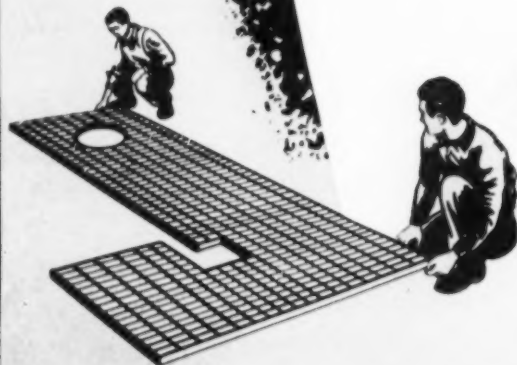
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ELIZABETH, N. J.

— MAIN PLANT—UNION, N. J.





# INDUSTRY SPEAKS

SOUTHERN POWER  
AND INDUSTRY

## NEW "HIGHS" Now "On-the-Boards" for Efficiency, Steam Pressure and Temperature

R. G. RINCLIFFE, president of the PHILADELPHIA ELECTRIC COMPANY, has announced plans to construct a power generating station that will establish new highs for efficiency, steam pressure and temperature.

"**R**EPRESENTING an initial investment of some \$45 million, the new power plant will serve the rapidly growing Delaware Valley and will add more than 10% to the present generating capacity of Philadelphia Electric Company."

The 275,000 kw turbine generator unit—the largest ever ordered—will be built by the Westinghouse Electric Corp. The steam generator for the plant will be built by Combustion Engineering, Inc., and will supply steam to the turbine at the highest steam pressure and temperature of any existing or projected power plant in the world—5000 psi and 1200F.—although initial operation will be at 1150F.

In discussing the unique engineering features of this new unit, K. M. Irwin, Philadelphia Electric's vice-president in charge of engineering, explained that the expected plant heat rate for steam conditions of 5000 psi and 1150F is 8400 Btu per kwh, some 600 Btu less than the heat rate for the most efficient existing power station.

The tandem-compound, four-cylinder turbine will operate at 3600 rpm, utilizing triple-flow exhaust to the condenser, and double reheat. Both reheats will be to 1050F.

All elements of the turbine except the super-pressure element are of conventional design using ferritic materials. The first, or super-pressure, element will be designed for initial steam conditions of 5000 psi and 1200F, exhausting at approximately 2400 psi.

The second element combines both high pressure and first reheat pressure turbines in a common casing. The third element combines intermediate pressure and single-flow low-pressure turbines in one casing, and the final element is a conventional double-flow low pressure turbine exhausting to the condenser at 1.5 inch Hg absolute pressure.

Steam will be condensed in a 105,000 sq ft, single pass, radial flow, Westinghouse condenser. Two

pumps, each of 75,000 gpm capacity, will provide cooling water to condense the steam. Special precautions will be taken to minimize leakage of circulating water into the condensate system. Nine stages of feedwater heating are contemplated, giving a temperature of approximately 565F boiler feed supply. Westinghouse feedwater heaters of approximately 31,000 sq ft will heat the feedwater.

The generator for the plant will be rated at 352,000 kva three phase, 60 cycle, 24,000 volts, 3600 rpm. It will be self-ventilated with shaft-mounted fans, and will employ hydrogen inner-cooling of rotor and stator conductors. Hydrogen pressure will be 45 psi.

Separate motor-driven d-c generators will provide excitation for the main generator. Magnetic amplifiers will be used to regulate terminal voltage of the generator.

The boiler will be a C-E Sulzer Monotube steam generator of the super-pressure "once-through" type and will employ the principle of forced circulation. It will be a twin-furnace design with tangential firing and reheat steam temperature control by means of tilting burners.

Maximum design steam conditions for the boiler are 6000 psi and 1200F. At rated load, primary steam flow will be 1,540,000 lb/hr. In the first stage of reheat, steam at 1050 psi will be reheated to 1050F. Conditions for the second stage of reheat will be 250 psi, 1050F.

Of the total heat transferred in the boiler, more than 65% will be absorbed in the superheater and the two reheaters. To accomplish this, radiant-wall type superheating surface will supplement the conventional suspended superheater and reheater sections. Three regenerative type air preheaters are to be installed.

Conventional combustion controls will be employed to meter fuel and air in proportion to steam demand. For control of steam and water flow and temperature in the steam generating unit, Sulzer automatic controls will be employed. These are of the oil hydraulic type and have been developed over an extended period and installed in many Sulzer Monotube boilers in Europe.



## Section 1

# Piping and Accessories

### Case 1—Southern Paper Mill

#### Transite Piping for Severe Service

**D**URING recent years increased capacity in Southern and Southwestern kraft mills has resulted in general upgrading of kraft papers and pulp. Grades of paper, which were saleable prior

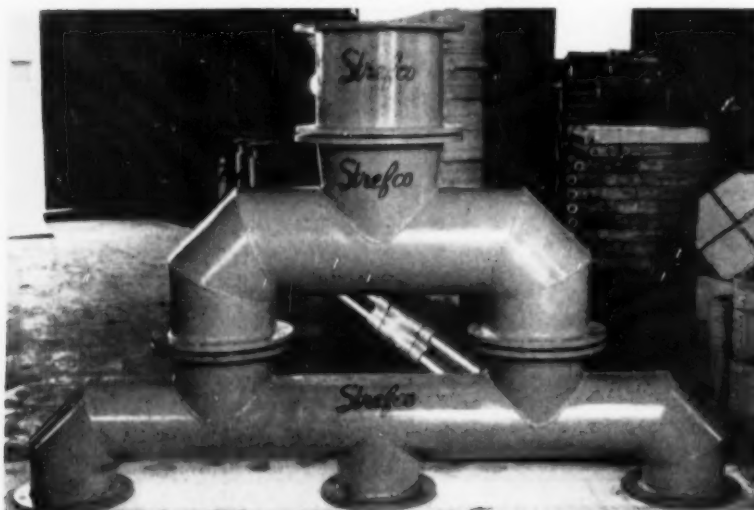
to the war, are not wholly acceptable today because of improved materials and methods used in processing.

A Southwestern mill faced high rejects because of contamination

from rust, black iron oxide, and decomposed stock. A certain portion of this trouble came from places other than the pipe lines; however, a major portion was directly attributable to the piping system.

Plant engineers decided that efforts to clear up these undesirable conditions would be directed toward the piping system on stock and white water. Investigation was made on various types of non-corrosive alloys, Transite (Johns-Manville), and various coatings on carbon steel pipe.

TYPICAL Transite lined pipe and fittings assembly manufactured by the Streed Fabricating Company, Attalla, Alabama.



#### Material Selection

Although the company had previously made several attempts to utilize the properties of Transite pipe, they had not been able to obtain satisfactory couplings or fittings. The mill was approached by Streed Fabricating Company, of Attalla, Alabama, concerning Strefco Transite lined fittings and Roto-Split flanges, and cost estimates for using these with Transite pipe were furnished. Mill engineers took these estimates and compared them with various other materials under consideration. They found that Transite pipe with Strefco Roto-Split flanges and Strefco Transite lined fittings was

slightly higher than carbon steel pipe but much cheaper than the non-corrosive alloys.

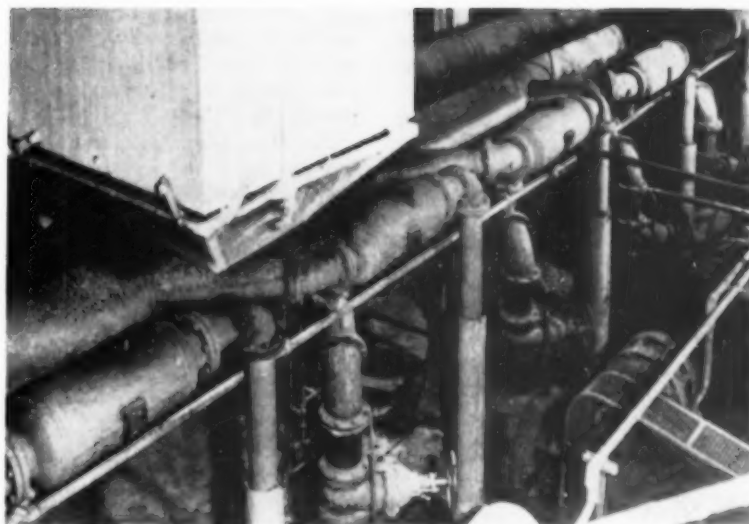
It was decided that they would make a trial installation of Transite. Particular attention was paid to proper methods for installation of the pipe and fittings, including use of expansion joints, thrust bracing and hanging. Transite installations were made using both steel jacketed Transite pipe around the refiners and bare Transite pipe with Strefco Roto-Split flanges elsewhere.

The following advantages have been noted by plant engineering personnel:

1. General Maintenance was low because of proper installation
2. Failures were nil
3. Use of caustic for flushing lines caused no ill effects.

The inside of the pipe after use was smoother than when installed on all stock and water lines where alum had not been introduced. Where furnish had been introduced there was some slight build-up; however, it was considerably less than had been experienced with standard steel pipe.

Satisfied with the performance, this plant standardized on the use of Transite for replacing other materials on stock and white water service as replacements became necessary.



Case 2—Missouri Chemical Plant

## Purifiers Lick Exhaust Problems

A MANUFACTURER of pigments in St. Louis recently overcame a difficult exhaust problem by installing purifiers. A serious nuisance and fire hazard existed because the air vented from the plant by 5 vacuum pumps contained large quantities of entrained oil that covered nearby equipment and buildings.

To correct this condition, the company installed 5 V. D. Ander-

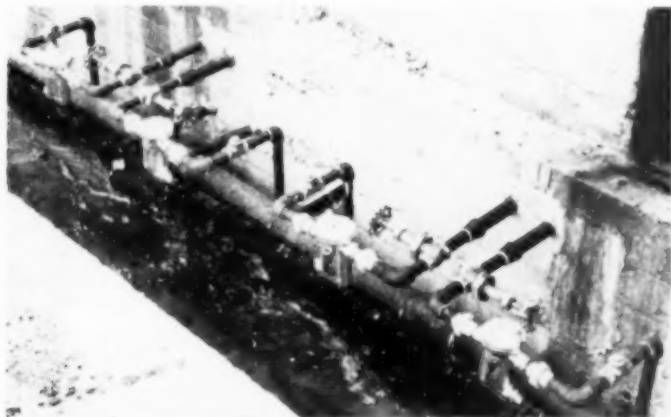
son Co. Hi-eF Line Type Purifiers on the manifold from each of the vacuum pumps. The discharge lines from the purifiers are tied into a single outlet header.

This installation has more than paid for itself not only by correcting a serious condition that could have resulted in a destructive fire but also by reducing maintenance on buildings and equipment in the surrounding area.

### Case 3—Virginia Lumber Mill

## Unit Trapping for Kiln Drainage System

By ROGER C. FLETCHER, Allan T. Shepherd Co., Richmond, Virginia.



IN Franklin, Virginia, plant engineers at the Camp Manufacturing Company had to work out a condensate drainage system for the plant's five new kilns.

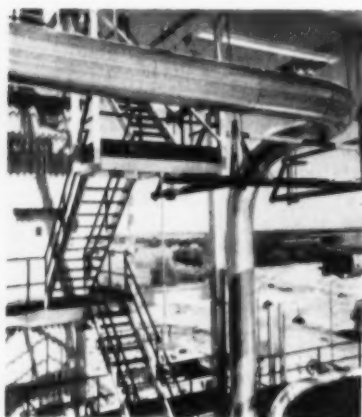
Installation of the kilns with ten coils per kiln for drying green lumber provided many interesting possibilities for piping arrangements. Unit trapping system installed, which has proved very satisfactory, affords efficiency, economy and easy maintenance. The above photo (closeup of trap hook-up) shows what was worked out in cooperation with Camp Manufacturing's engineer J. J. Forrer and kiln foreman W. E. Tomlin.

Unit trapping was selected in preference to master trapping each kiln. Each of the ten coils of each kiln were trapped with an Armstrong Machine Works' No. 881,

which has a built-in strainer. Thirty of the traps are located at the dry end, twenty at the green end. Each kiln employs eight hand valves to shut off ten coils. Thus, six of the ten coils in each kiln can be isolated from each other. The two coils at each end have a common valve and are therefore shut off together.

The Armstrong traps have 5/32 in. orifices, to operate at pressure differential created between the 55-60 lb steam pressure used, and the back pressure of about 25 lb, which exists at the traps, consisting of about 10 lb static head to the elevated return line and about 15 lb dynamic head in the 600 ft long return line.

Big advantage of the unit trapping over master trapping is complete and faster air and condensate removal.



PIPING insulation at OG&E's Arbuckle Station features Armstrong Cork Company's Bestfelt pipe covering and aluminum jacketing.

#### Case 4—Oklahoma Utility

### Piping Protection

**T**HE Arbuckle Station of Oklahoma Gas and Electric Company is the first completely outdoor type central station built by the Company.

Piping for such outdoor stations presents the problem of adequately protecting the insulation from the elements. All of the outdoor piping has been insulated with Armstrong Cork Company's Bestfelt pipe covering and weatherproofed with

.020" thick plain sheet aluminum. The jacket gives pleasing appearance and should result in considerable saving in maintenance and painting costs.

Bestfelt insulation, made of crimped layers of asbestos paper, 33 laminations per inch, was ideal for the pipe covering job as it is suitable for temperatures up to 700 F. Insulation not exposed to weather is finished with 8-ounce canvas jackets.

For complete description of OG&E's Arbuckle Station see SP&I for August, pages 64-70. Design and operation features are reported by J. B. Stout, chief mechanical engineer.

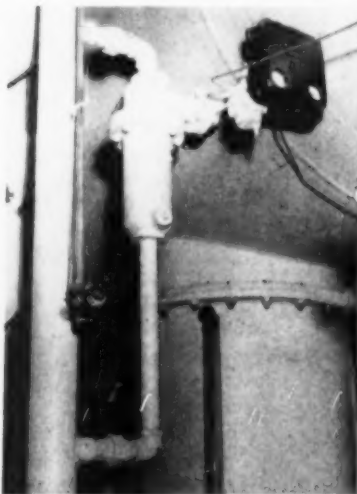
#### Case 5—Texas Chemical

### Pump Loses Suction

**A** 4,000 kw condensing turbine gave trouble when first installed due to erratic operation of the hotwell pumps. This was caused by the pumps apparently losing suction.

A check on elevations showed that the equipment was set, the normal level in the hotwell would be only 25" above the center line of the pump, which was not enough head. Space limitations made it impossible to either lower the pump or raise the condenser.

The trouble was completely

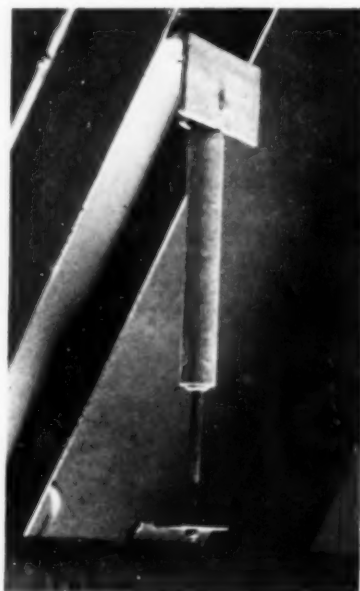


NEW 3" water column permitted raising of the level control. This made it possible to maintain a more positive head on the suction side of the hotwell pump.

eliminated by fabricating a new water column out of 3" pipe and connecting it to the side of the condenser. The level controller was mounted on this new water column in such a manner that it could be set to maintain the level at the top of the hotwell, instead of about half way down.

This change raised the level 25" more, making a total of 4' 2" head over the center line of the pump. At this setting the pump operated perfectly, eliminating the need of costly alterations to building and condenser settings.

By H. J. GILBERT, Department Head, No. 1 Steam & Power Production, Carbide and Carbon Chemicals Company, Texas City, Texas



#### Case 6—Texas Chemical

### Restraints on Free Floating Pipe Lines

**O**N A NUMBER of small, free floating pipe lines we have found that the use of double acting automotive type hydraulic shock absorbers prevents damaging pipe vibration without unnecessary restraint to the pipe expansion. Photo shows a typical application of the shock absorbers.

By M. A. LADT, Department Head, No. 2 Steam & Power Plant, Carbide and Carbon Chemicals Company, Texas City, Texas



## Case 7—Texas Rubber

### Tighter Seating

A SOUTHWESTERN butadiene plant is now using Crane 18 in. steel gate valves on suction lines from extractive distillation towers to pumps. Working pressure, 90 psi, 250 to 300 F.

The original valves in this service were lubricated plug valves, but they couldn't be made to seat tightly on the light hydro-carbons and furfural mixture. Their continual leakage burdened the plant with excessive maintenance, and a constant threat to process control.

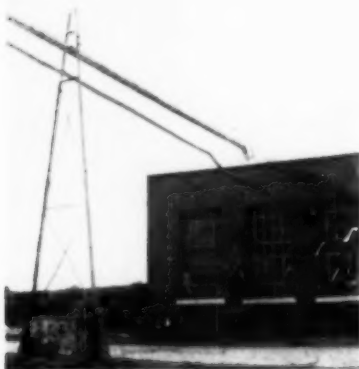
All these lubricated plug valves were replaced with Crane 33X steel wedge gate valves. Installed more than 2 years ago, the new valves remedied the leakage trouble and have worked satisfactorily.

## Case 8—Alabama Textile

### Overhead Steam Line

OUR original steam main installation from boiler house to mill building was through an underground duct of terracotta with undergrain. During heavy rains this underground main became submerged, the insulation water soaked, causing heavy loss by condensation.

As the steam line ran under a railroad track and a 16 ft wide concrete pavement, we decided to abandon the old line and substitute with a new overhead installation.



Our maintenance personnel erected an A-frame support, fabricated with 4" channels and 1½" angles by electric welding, on a

heavy concrete pier, midway between mill building and boiler house. The concrete pier for the A-frame was made extra heavy due to its location near the street pavement, to prevent accidental contact by traffic.

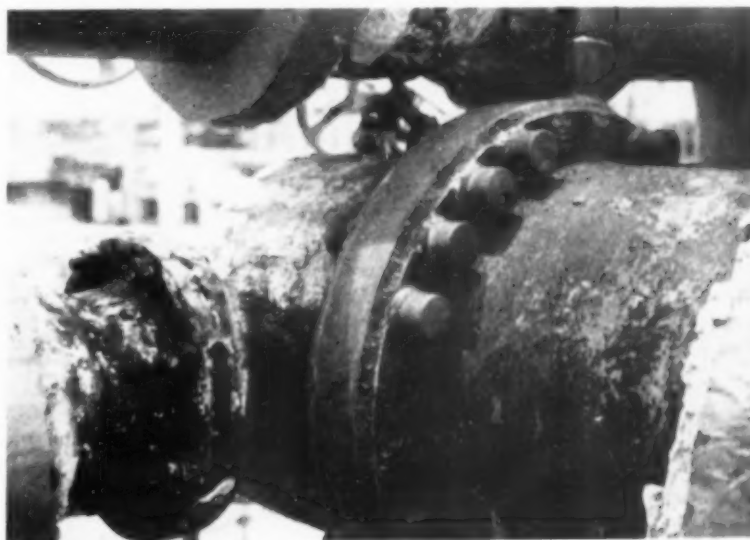
A short A-frame was mounted on boiler house, the 5" pipe and long radius ell was purchased with beveled edges for electric welding. 5/8" galvanized stranded messenger cable was anchored to wall of building and roof of boiler house, over

top of A-frame and through pipe hangers with rollers on cable to allow expansion movement.

This line was insulated with 1" magnesia pipe covering and covered with aluminum jacket made for that purpose.

Photo shows later additions hung from this same support. A 1" galvanized air line, and a 1½" condensate return line that formerly ran underground.

By H. C. NORMAN, Master Mechanic, West Boylston Mfg. Co., Boylston, Alabama



## Case 9—Texas Chemical

### Leaking Flange Repairs

IN AN effort to stop leaks on high pressure steam flanges where continuity of service prevents their being regasketed, it has been the practice to weld up the flange. Two systems have been used, both of which are an improvement over the old practice of fillet welding between flange faces and seal welding the bolts and nuts.

As illustrated, a vent condenser head composed of three separate flanges (shell flange, tube sheet, and channel flange) have been covered by a mild steel band with a drain installed to vent the leaking steam until the weld is completed. The studs are then cut off flush with the nut. Stud and nut

are covered with an appropriate size of socket weld cap. Where limited space prevents the use of a cap, the stud is cut off flush with the flange and welded to it.

Another system uses a section of pipe of inside diameter sufficient to snugly fit the outside diameter of the flange. The pipe ends are swaged down to the outside diameter of the pipe and the complete assembly is then split and welded one-half at a time over the flange in line. A drain is also necessary here to facilitate welding of the line. This same system may be used to cover orifice flanges by notching out the pipe cover at its longitudinal joint to allow the orifice nipples to extend through the seal welds to cover to the nipples.

By M. A. LADT, Department Head, No. 2 Steam & Power Plant, Carbide and Carbon Chemicals Company, Texas City, Texas



## Section 2

# Power and Steam Supply

### Case 10—Kentucky Chemical Plant

#### Low Cost Plant Burns Low Cost Coal

*Semi-outdoor plant is designed to burn low-cost coal with minimum manpower and maximum economy.*

**I**N Louisville, Kentucky, Stauffer Chemical Company's new multi-million dollar process plant includes a boiler plant embodying several non-traditional design concepts. This has resulted in an unusually low investment cost and minimum operating costs with no sacrifice in efficiency or reliability.

The New York engineering firm of Singmaster & Breyer, design and construction management consultant to Stauffer on both the process and steam plants, were well aware of the extremely high degree of reliability required of the boiler facilities. A low cost plant was attractive to both the client and the engineers if this could be accomplished without compromising on performance.

#### Fuel Selection

Coal removed in mining operations during the undercutting of

the seam before blasting is referred to as "washed carbon." This fuel,  $\frac{1}{4}$ " x 28 mesh, was available at \$1 per ton less than sized coal of the same analysis. If advantage were to be taken of this low cost fuel, special design consideration would be required for the handling equipment, storage facilities and stokers, because of the coal's high moisture content, high sulfur, and relatively low ash fusion temperature. See proximate analysis.

#### Proximate Analysis ( $\frac{1}{4}$ " x 28 Washed Carbon)

Moisture	10.0%
Volatile	37.4
Carbon	46.0
Ash	6.6
Total	100.0%
BTU/lb	12,450
Sulfur	2.8%
Fusion	2050°F

Climatological data indicated that an outdoor boiler installation with housing provided only for firing aisle and boiler auxiliaries was entirely feasible. Two water tube, water wall boilers rated at 38,000 lb/hr each at a design pressure of 200 psig were selected to meet the demands and uninteruptible nature of the steam load.

Direct feed, traveling grate stokers proved to be a superior design for fine coal since very close clearances between the grate clips may be maintained, resulting in minimum siftings losses. Stoker drives (one motor, one turbine) are interconnected to permit continuance of operation under any emergency condition.

The selection of stokers was further influenced by local air pollution regulations. Experience in the Louisville area with traveling grate stokers without dust collection had been very satisfactory, and data on anticipated dust concentrations indicated a loading of .5 to .6 lb per 1000 lb of flue gas which is well within the maximum limit of .85 lb per 1000 lb fixed by the Louisville Air Pollution Control Commission.

The boilers were designed with bottom gas outlets to make feasible the installation of the turbine

driven I.D. fans and venturi stacks close to grade elevation. This arrangement resulted in a saving of better than \$10,000 in steel structure. A filler piece was provided to permit the installation of dust collection equipment, should the present code later be revised.

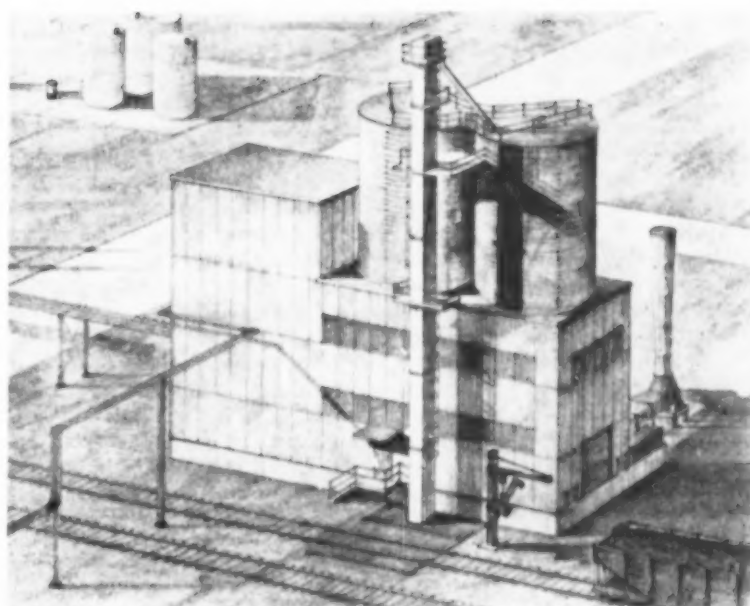
Exhaust from the F.D. fan, I.D. fan, and feedwater pump turbines supply 5 lb steam to a jet type deaerating heater located on the second mezzanine of the boiler house. 95% of boiler house condensate and 50% of process condensate is returned to the deaerator. Make-up water is treated in a dual unit, fully automatic hydrogen cycle zeolite softener.

### Combustion Control

The combustion control system, which is air operated and fully automatic, consists of locally mounted air flow regulators and furnace draft regulators, each operating a steam regulating valve on the F.D. and I.D. fan turbines respectively.

In consideration of the relatively small size of the boiler installation, remote manual control stations were not specified for each individual regulator. However, each unit is equipped with a hand operating lever for emergency operation. A stoker regulator operates the stoker speed control valve to match stoker feed characteristics to the fan and boiler characteristics.

The panel mounted boiler master control equipment includes a remote manual control station for each boiler. Steam flow-air flow



Drawing of boiler plant

boiler meters record and indicate steam flow and relative rate of air flow, record flue gas temperature, and integrate steam flow.

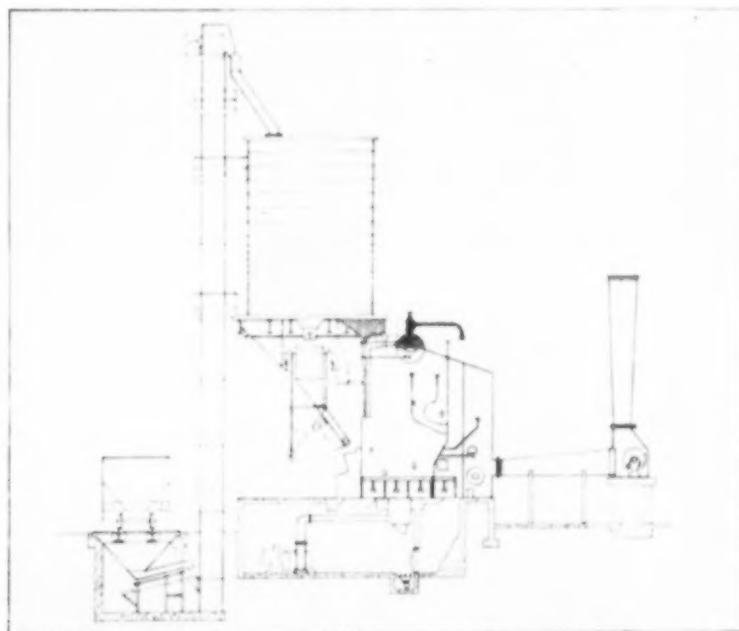
### Coal and Ash Handling

The coal handling system is designed to deliver  $\frac{1}{4}$ " x 28 mesh washed carbon or any better grade of coal to the stoker hopper of either or both boilers. A jib

mounted car shake-out is provided to reduce unloading time. The design capacity of the undertrack hopper-apron feeder-bucket elevator combination is 30 tons per hour. An electrical interlock prevents the operation of the feeder when the elevator is not running.

Open screw conveyors located at the top of each silo carry the coal peak (formed at the chute out-

Cross-section showing general arrangement.



### EQUIPMENT SUMMARY

**Boilers**—Henry Vogt Co.  
**Stokers**—Riley Stoker Corp.  
**Drives**—Electric-Master Electric Co.  
**Steam**—Coppus Engineering Co.  
**Induced Draft Fan**—Pratt-Daniel Corp.  
**Drive**—Whitton Machine Co.  
**Forced Draft Fan**—Buffalo Forge Co.  
**Drive**—Whitton Machine Co.  
**Venturi Stack**—Pratt-Daniel Corp.  
**Combustion Control System**—Republic Flow Meters Co.  
**Boiler Meters**—Republic Flow Meters Co.  
**Coal Handling System**—The Columbus Conveyor Co.  
**Ash Handling System**—National Conveyors Co.  
**Coal Silos**—Marietta Construction Co.  
**Water Treatment**—Worthington Corp.

lets) across the silo diameter, thereby utilizing the full capacity at the silo tops. The angles of chutes and silo hoppers and floors were designed to accommodate the fine coal specified. All feed openings were designed as large as practicable to eliminate arching or bridging. It should be pointed out that the precautions taken in this respect have resulted in extreme ease of operation and elimination of coal handling difficulties.

The two concrete stave silos supported on the boiler house roof afford all of the advantages of overhead steel bunkers at considerably lower initial cost. Better than one week's supply of coal is stored over the stokers, insuring uninterrupted operation independent of elevating equipment. Further, the full capacity of the silos is in live load (since there are no

shelves) with the coal feeding directly into a motor operated weigh larry. The use of a larry insures good distribution of coal across the entire stoker width.

The ash handling system is a pneumatic (steam operated) unit designed to convey dry ash at a rate of 6 tons per hour. The system is operated once each shift for approximately 7 to 10 minutes, conveying the ash to an open disposal area.

The partial boiler house is of steel construction with corrugated asbestos siding. Foundation is of high density, poured concrete, and the entire installation is built on precast reinforced concrete piles.

### Operating Costs

The plant operates on a three shift basis, with one operator per shift, plus an additional man on

the day shift for unloading coal cars and miscellaneous duties.

The initial cost of Stauffer's boiler plant including engineering and construction management was \$6.38 per pound of steam per hour. By comparison, plants of this size usually average \$8.00 to \$10.00 investment per pound of steam capacity. Further, the total cost of steam (including fuel, labor, maintenance, power, chemicals and fixed costs) based on the actual steaming rate is only \$.60 per 1000 lbs.

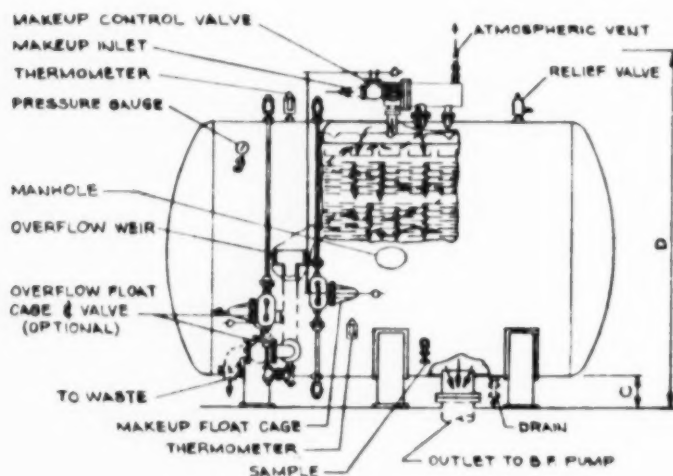
By MARTIN SWICKLE, Singmaster and Breyer, Engineers.

### Case 12—Virginia Utility

## Rubber Bearings Solve Submerged Pump Problem

EACH of the turbines in our hydroelectric plants has its individual submerged sump pump which must operate positively or a unit outage may ensue. Until recently these pumps were equipped with bronze guide bearings which had to be greased daily, and even then had a short life due to grit cutting both the shaft and bearing.

This trouble was accelerated after additional industrial water uses were installed up-river during 1951. These new industrial plants discharge large quantities of waste sand which, being held in suspension in the Kanawha River,



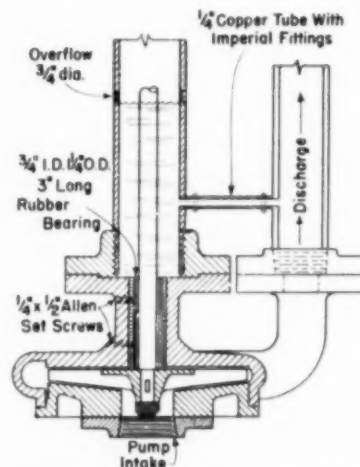
### Case 11—Tennessee Paper Mill

## Heater Design for Restricted Headroom

A NEW large paper company in Tennessee recently required a deaerating heater for their boiler feedwater system. Headroom was greatly restricted, making it extremely difficult to install the proper sized heater, 200,000 lb/hr, without excessive building costs.

Graver Water Conditioning Co. solved the problem by furnishing a completely horizontal tray type deaerating heater with all of the deaeration section and tray bank contained in the storage section as shown in the sketch.

Unit is 11' 0" diameter x 19' long, ASME Code Construction, and is designed to handle 200,000 lb/hr with 4 minutes storage of deaerated water. Unit has an internal vent condenser of stainless steel and trays are of all stainless steel construction.



Submerged pump with water-lubricated cutless rubber guide bearing.



eventually finds its way into our pumps. Erosion of the bearings made maintenance on these small pumps excessive.

Our experience with water-lubricated rubber guide bearings on the main turbine shafts has shown that they resist wear, so we decided to try marine bearings of this type on the submerged pumps. Since 3/4-in. ID marine bearings were the smallest stock items obtainable, we substituted this size shaft for the former 1/2-in. pump shafts, bored out the bearing housings to accommodate the 1 1/4-in. OD x 3-in. marine bearings, and locked them in place with set screws as illustrated.

Positive water lubrication of each pump bearing is obtained by a 1/4-in. connection between the pump discharge line and the column above the pump bearing. Existing overflow holes above the connection prevent flooding of the column.

The marine bearings, designated as Grade GRN, oil-resisting, cutless bearings, consist of hard-rubber vulcanized in a brass tube and grooved for circulation of water. The 3/4" x 1 1/4" x 3" bearings, obtained from Lucian Q. Moffitt, Akron, Ohio, cost \$6.70 apiece and were easily installed.

This installation of cutless rubber pump bearings has been in service one year without giving any trouble. Recent inspection did not reveal any wear on either shaft

or rubber bearing. Pump maintenance expense has been reduced at least 50% by this change.

Plants having trouble with submerged pumps may find relief by using this type of bearing which

is also available in larger sizes and special sizes within manufacturing limitations.

By R. W. SPEAS, Hydro Plant Supervisor, Kanawha Valley Power Co., Charleston, W. Virginia.

### Case 13—Florida Utility

## Packaged Boilers Heat Oil Storage Tanks

**O**RIGINALLY, steam from a 20 hp locomotive type steam boiler satisfied the steam requirements of the Florida Power Corporation's Port Tampa terminal. At this terminal, oil is received by tanker and pumped into storage tanks.

Because of the tremendous increase in power generated in recent years, this oil terminal has been expanded from one storage tank and pump to the three tanks now in use. Oil received by tanker is pumped into the three 80,000 barrel storage tanks. Part of this oil, about 30,000 barrels, is shipped out by rail to the Florida Power Plant in Avon Park. Oil to four of the other steam plants is supplied by barge from the Port Tampa Terminal at the rate of about 235,000 barrels a month.

Naturally, more steam was needed to handle this increased load. In 1951, Florida Power installed a 100 hp Cyclotherm Steam Generator, manufactured by Cyclotherm Division, United States Radiator Corporation. Demand continued to grow, and in 1953 a 150 hp steam generator was installed next to the original 100 hp unit.

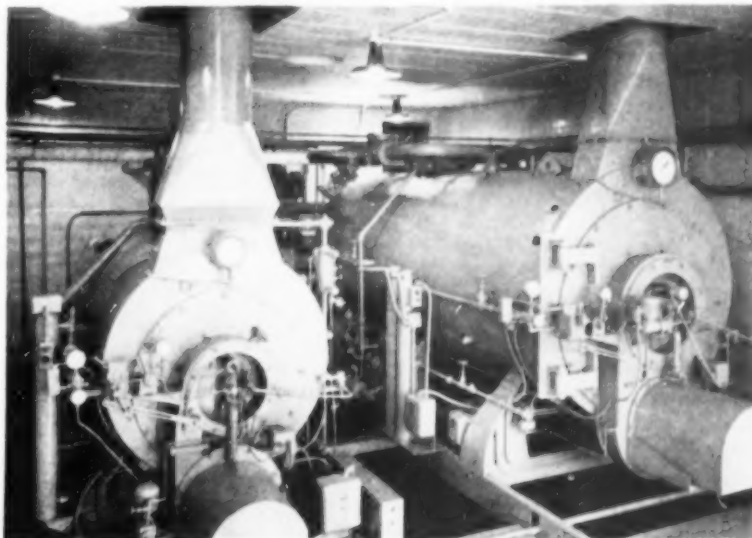
These two steam generators supply steam to heating coils in the tanks, maintaining the temperature of the oil that is being pumped at about 140 F. All of the 10" and 12" oil lines at the terminal, totaling about a mile in length, have internal steam tracers of 1 1/4" pipe. Steam is used in the tracers to keep the oil in the lines hot and fluid for easy pumping.

**THESE Cyclotherm generators supply steam to heat three 80,000 barrel storage tanks at the Florida Power Terminal at Port Tampa. 150 hp boiler at the right is the latest installation. The Cyclotherms use LP gas for lighting off and #6 oil from the storage tanks for firing.**

### More Information Available

Many of these procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case studies are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment manufacturers are identified in the articles. If additional information is desired, contact your local mill supply house, the manufacturer's representative in your area, the equipment manufacturer's headquarters, or write The Editors, SP&I, 806 Peachtree St., N.E., Atlanta 5, Georgia. There is no obligation.



## Case 14—Arkansas

### Water Level Detection

**R**ECENTLY the generating capacity of the Lake Catherine Plant was increased by 110,000 kw. With the installation of a Foster Wheeler boiler, operating at 1600 psi, 1000F and a capacity of 900,000 lb/hr, we were confronted with the problem of boiler water level detection under all conditions of operation. The location of the boiler was such that a correct image of the gage glass could not be transmitted to the operating room by mirrors and ducts. Several attempts at redesigning the duct work failed, since a distorted image was produced.

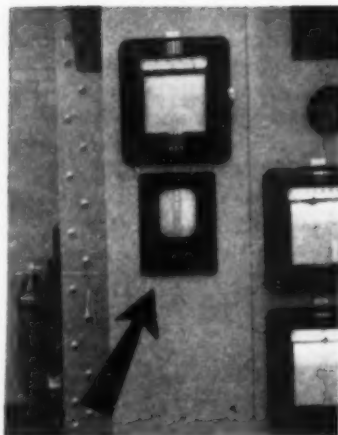
Mechanical level indicating and controlling devices were in service and doing a satisfactory job under normal operating conditions; however, these instruments could not be relied upon for accuracy until the boiler pressure was near operating range. Several incidents occurred which rendered these instruments temporarily inaccurate.

#### Utiliscope Installed

Therefore it was decided that, in order to insure safe operation, there was a definite need for continuous and accurate monitoring of the water level. Since the boiler was equipped with Diamond gage glasses, the Diamond Utiliscope was investigated and found to be readily adaptable to the problem at hand. The equipment consisting of camera, power unit and monitor was purchased and installed by plant personnel.

Upon completion of the installation a picture was produced on the monitor in the control room which accurately showed the water level. The length of cable required between the power unit and the monitor was approximately 300 ft. This equipment has been in service some twelve months and has required very little maintenance.

Recently the 2500 series gage glass was replaced by Diamond Multiport assembly. This new glass has not been in service long



Diamond Utiliscope installation in Arkansas Power & Light Company's Lake Catherine Station.

enough to predict its future. However, it does show up well on the Utiliscope and shows promise of appreciably reducing gage glass maintenance hours as well as cost of replacement parts.

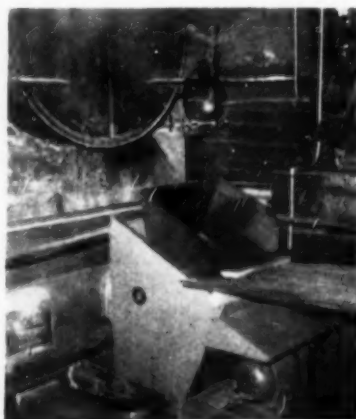
We feel that when properly installed and maintained this equipment does a satisfactory job of showing the water level in a boiler drum.

By JAMES G. AKINS, Results Engineer,  
Lake Catherine Steam Electric Station,  
Arkansas Power & Light Company

## Case 15—N. C. Laundry

### Low Maintenance and No Shutdowns

**I**N Asheville, North Carolina, Minico, Inc., was faced with a problem calculated to give any laundry management nightmares:



how to avoid complete plant shutdowns when the single coal-fired boiler needed repairs or service.

The solution came, according to Minico Manager Herman G. Nichols, with the installation of an Iron Fireman hopper-model stoker. Stoker firing has proved to be successful from the standpoint of low maintenance expense, and in addition the local service provided by trained dealer representatives has prevented any shutdowns since the stoker was installed in March, 1952.

## Case 16—Tennessee

### Fly Ash Collector Eliminates Problems

**T**HE Modern Chair Company of Morristown, Tennessee, cured a bottleneck in their finishing department and solved a difficult public relations problem caused by fly ash from their boiler plant. They installed a fly ash collector to correct the problem at its source.

#### Full Supply

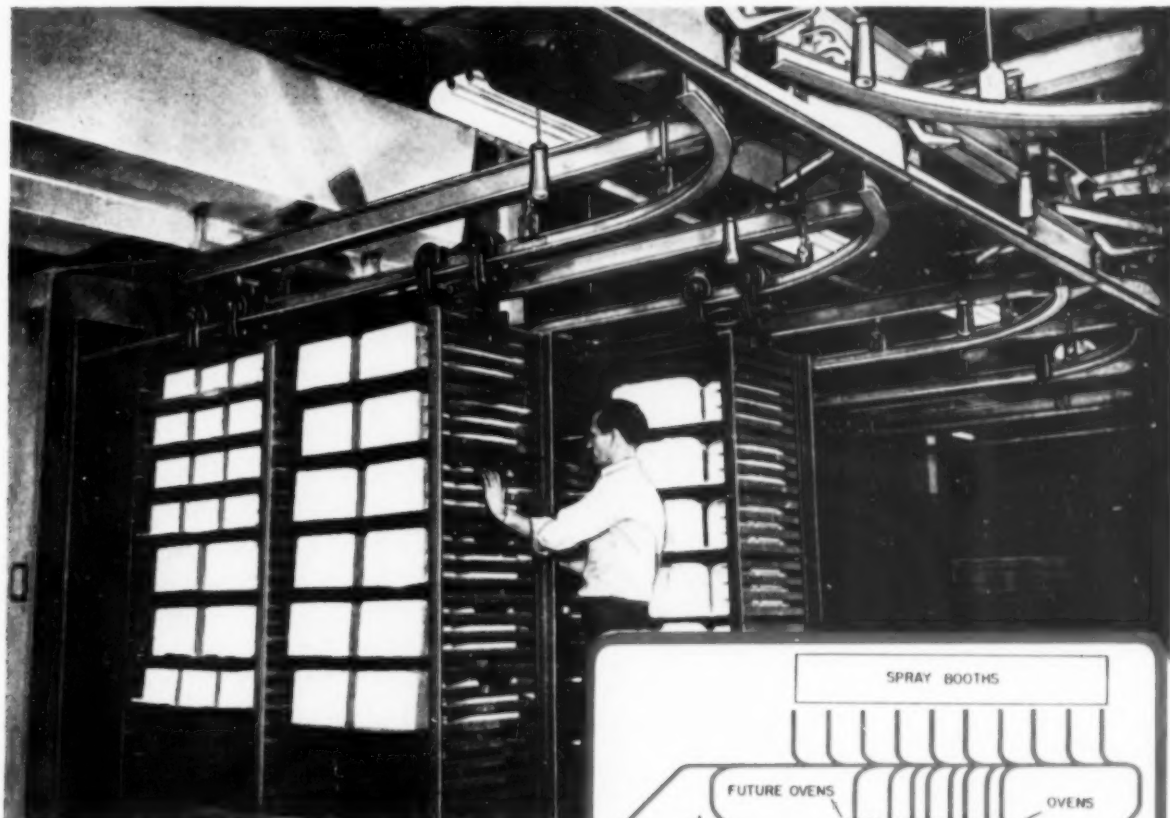
The Modern Chair Company are manufacturers of high grade furniture. Their boiler plant is equipped to burn either coal or wood waste from the manufacturing operations. Efficient burning of wood waste nearly eliminates fuel cost and, at the same time, solves the problem of getting rid of the refuse. In burning sawdust, shavings, etc., a serious problem was encountered. Some of this material does not burn completely and a light, black fly ash was scattered from the chimney.

#### Production Troubles

Fly ash in the atmosphere around the plant caused serious trouble in the finishing department. Small particles stuck to the freshly lacquered surfaces and a great deal of furniture had to be refinished. In addition, fly ash was a nuisance in the residential section of Morristown and also made the problem of plant housekeeping difficult.

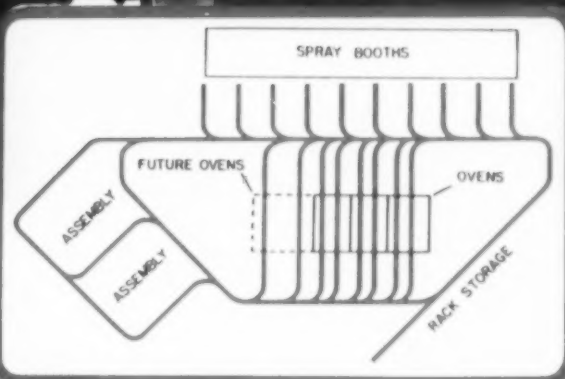
Company engineers decided to install a Regenerative Fly Ash

# Handling a broad range of shapes and sizes?



## Louden engineered systems have the answer for that too!

The installation shown above is one of the answers Loudon *engineered* overhead handling systems have for all handling problems. Here, a big enameling and japanning plant finishes everything from small parts to desks and cabinets. Loudon monorail and man-powered conveyor racks handle work from dipping vats into baking furnaces on into storage. No unloading. No rehandling. No delays. No



floor maintenance. Manpower and handling costs are cut, operations are accelerated.

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**Since 1867—the first name in materials handling**



AT THE Modern Chair Company in Tennessee space in the boiler room was at a minimum. Since no fans were required, a vertical flow Regenerative Fly Ash Collector was installed as a section of the steel stack above the roof. Similar units can be installed in the breeching or ductwork.

Collector, manufactured by Breslove Separator Company, Pittsburgh, Pa., to remove the fly ash from the stack gas. The unit has completely corrected the difficulty.

Percy Munroe, president of Modern Chair Company, reports that the atmosphere around the plant is now clean and the dust problem in the finishing department has been eliminated. This has been a great help in their production and they are also very pleased with the saving in labor to clean up the plant.

Breslove Separator Company's Regenerative Fly Ash Collector is a high efficiency unit which spins the gas stream at very high speeds to separate the fly ash by centrifugal force, then recovers the velocity energy of the spinning gas stream as pressure. Pressure drop of these units is so low they can be operated on the "natural draft" of the chimney without requiring fans or other auxiliary apparatus. Their efficiency is very high, even on very light material, over the full range of gas flow so that the fly ash nuisance is eliminated under all loads.

These collectors are made in a wide range of sizes and arrangements for all types of plants, and for either horizontal or vertical gas flow.

#### Case 17—Texas Chemical

### Hotwell Pump Trouble

THE Hotwell Pumps on two 4,000 kw condensing turbines gave considerable trouble when first put in service. The pumps apparently overloaded the motors, causing them to heat up and trip off.

Examination of the performance curves showed the design of the pump to be such that very small changes in the total head or pump discharge pressure changed greatly the amount of the

water pumped and the horsepower required.

These variations, of course, overloaded the motor. The level in the hotwell was controlled by a recirculating line and a motor valve. This operated to bypass back to the hotwell, varying amounts of condensate, depending on the turbine load.

The trouble was completely eliminated by installing a back-pressure regulating valve in the condensate line down stream of the bypass take-off. This back-pressure regulator was then set to hold the discharge pressure at the design point. This kept the flow and horsepower requirements within the capacity limits of the installed equipment, eliminating the need of new pumps or larger motors.

By H. J. GILBERT, Department Head, No. 1 Steam & Power Production, Carbide and Carbon Chemicals Company, Texas City, Texas



#### Case 18—Virginia

### "Loco" Heating Plant Meets Emergency

THESE two locomotives supply steam for hot water and heat to a new area of the greatly expanded Oceana Naval Air Station near Norfolk, Virginia.

When commanding officer Capt. W. S. Butts learned that the planned heating plant would be delayed, he put these two surplus locomotives to work producing steam. But a locomotive depends on forward speed to provide draft for its boiler. So Capt. Butts had this temporary power plant rigged with a DeBothezat induced draft Bifurcator fan on the stack. This novel arrangement provides the necessary draft.

Oceana Naval Air Station reports that this temporary plant will adequately serve until January when the planned heating system will be operating.



**You Get Time-Tested  
Dependability With**



# NAVCO *Counterpoise*<sup>\*</sup>

## Pipe Hangers

The constant load-carrying capacity of Navco Counterpoise<sup>\*</sup> Pipe Hangers has been proven during an extended period of satisfactory service as the first accurate and efficient support for high temperature piping systems. They are being used extensively in steam generating stations, refineries and chemical plants.

The Counterpoise Hanger is a spring-actuated counterbalance. An ingenious system of linkage transforms the varying force of the spring in an accurate mathematical ratio to produce a load supporting effort of constant value throughout the entire range of expansion travel.

The design permits great flexibility of installation and saves valuable space in congested areas. All parts are ruggedly made and have a high safety factor, yet excess weight and oversize physical dimensions have been avoided to hold space and structural load requirements to a minimum.

The Navco Counterpoise Hanger is available in 16 different frame sizes with load capacities ranging from 200 to 16,000 pounds and expansion travels up to 12 inches. For detailed information on how you can get dependable support with this unique hanger, write today for our 12-page illustrated bulletin #153.



Note above how the flexible top connection permits the hanger assembly to fall in line with the direction of the load pull, so that horizontal travel of the piping has no appreciable effect on the hanger operation. The unit may be positioned at any angle. This affords flexibility in installations where close clearances are a factor.

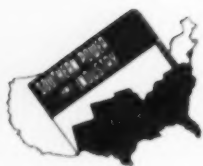
<sup>\*</sup> Counterpoise is a trade name of the National Valve & Manufacturing Company



**NATIONAL VALVE & MANUFACTURING COMPANY**

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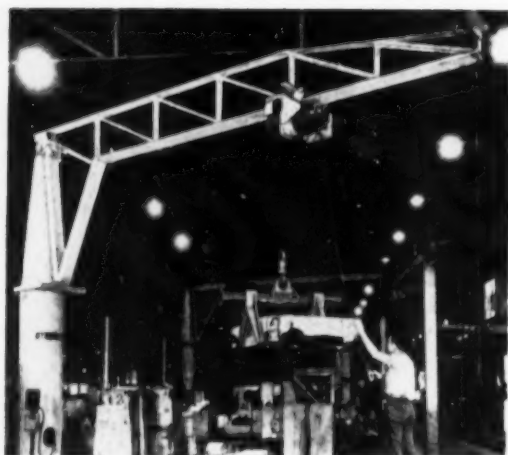
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**BETTER PRODUCTION . . . . . in the South and Southwest**

## Section 3

# Materials Handling



*Case 19—Texas Metalworking Plant*

### Self-Supporting Jib Cranes Offer Lower Costs & Efficient Handling

PACKAGE of laminations handled with special grapple. LeTourneau hoist receives power from trolley wires on truss type crane arm. Jib crane design permits continuous 360° pivoting of load without reversing direction.

THE Longview, Texas, plant of R. G. LeTourneau, Inc., owes its design and layout to the requirements of heavy material handling. Large and heavy sections of steel plate, welded assemblies and machined parts—all of these must move through the 540,000 sq ft Longview plant and emerge as LeTourneau Treesaws, Tractors, Mobile Cranes, Off-Road Transporters, Jib Cranes, Electric Hoists and other land clearing and material handling equipment.

The largest handling unit in this big intra-plant moving job is a LeTourneau overhead bridge crane

of 100-ton capacity. This 110 ft crane extends across the width of the main assembly area and travels the length of the plant.

#### Jib Crane Selection

In designing the plant it was fundamental that the building's structural columns be substantial enough to support the overhead bridge crane, as well as the building. However, to further strengthen the building framework for mounting the scores of smaller cranes and hoists needed in the various specialized manufacturing areas would have been uneconomical.

The lower installed cost and operational advantages of pillar type jib cranes sold the plant designers on a multiple installation of these versatile cranes for the routine heavy material handling job.

To obtain the necessary materials handling capacity, fifty LeTourneau manufactured pillar jib cranes of 6-ton capacity were located to cover over 75% of the total floor area devoted to manufacturing. Each jib crane was installed in the middle of a manufacturing section as its 360° rotation allowed full use and no

# 3-way answer

## to steam trap problems

\* This three-way combination can help lick your steam trap problems.

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the steam trap that gets equipment *hot in a hurry and keeps it hot*. Small size, light weight, body and all working parts of stainless steel. Low cost, low maintenance.

### YARWAY FINE SCREEN STRAINER...

with high-grade woven Monel wire screen that is removed with the cap for easy cleaning. Rust-proof finish... straight threads, machined faces and spark-plug type gaskets on screen caps.

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\* YARWAY IMPULSE STEAM TRAPS AND STRAINERS are immediately available from more than 250 Industrial Distributors in the United States, Canada, and other countries. For name of one nearest you and FREE Steam Trap Bulletin write...



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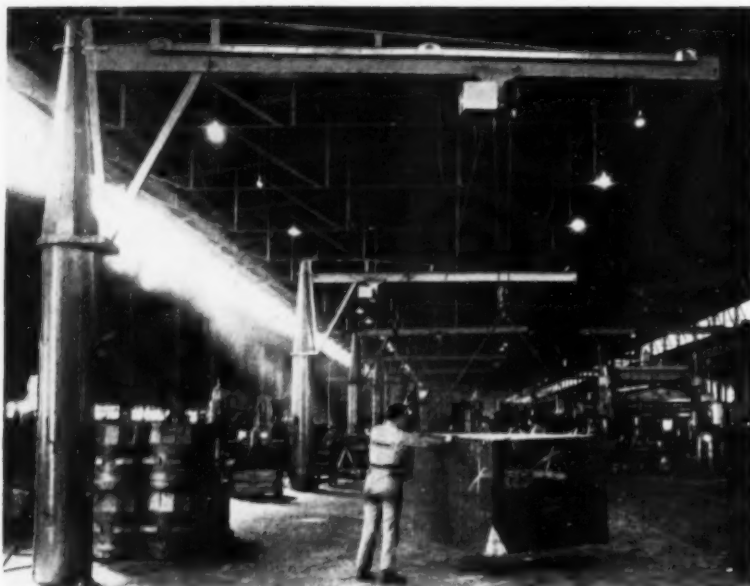
YARWAY Fine Screen Strainers. "Police the pipelines" in thousands of plants.



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## impulse steam traps

And Yarway Fine Screen Strainers



interference to building columns, aisles or overhead crane. The pillars also could serve as centralized outlet for air and electric services and storage for hoses and cords. LeTourneau hoists and hoists by several competitors (for comparison tests) from two to six ton capacity were installed.

Twenty smaller pillar jib cranes and twenty-eight wall jib cranes supplement the larger units on specialized jobs.

#### Handling Advantages

Since the jib crane can lift, move and position a light or heavy load within an area of over 1936 sq ft, experience has shown that no productive time is lost waiting for the lifting help since the crane is right at hand. The fork trucks are released for distance moving of palletized loads and storeroom stacking. The overhead crane is always available for those big jobs no other unit can do.

Proof of this materials handling arrangement is in the following:

- 20% lower installation cost
- 32% less time down waiting for other material building equipment
- 40% increased efficiencies of process
- 21% less personnel injuries

Additional proof of this materials handling arrangement was demonstrated when the company

recently began manufacturing the products listed above. This plant had to be completely rearranged flow and operation-wise from a

FIFTY LeTourneau manufactured pillar jib cranes of 6 ton capacity were located to cover over 75% of the total manufacturing floor area. Twenty smaller pillar jib cranes and twenty-eight wall jib cranes supplement the larger units on specialized jobs.

Vertical column takes up less than 5 sq ft of floor space, yet the jib span serves an area of 1936 sq ft. Pillars can serve as centralized outlet for air and electric services and storage for hoses and cords.

previous one-product operation. Only one crane had to be deactivated while seven were added. Time studies showed fitting the machines to the jib crane utilized floor space to the maximum and eliminated unnecessary work handling.

By E. A. BARTSCH, JR., Electrical Engineer, R. G. LeTourneau, Inc., Longview, Texas



Case 20—West Virginia Chemical Plant

### Bayonet-Type Boom Handles Big Bags

THIS unique demonstration at Carbide and Carbon Chemicals Co., South Charleston, W. Va., shows a fork "Liftruk" handling bulk materials in special rubber container bags.

Equipped with special Bayonet Boom, the Silent Hoist & Crane Co. lift truck is handling special 3000 gallon collapsible Neoprene containers. The bag is almost in shape of a cube, about 8 ft on each side. The top bag is fitted with a steel forged eyelet at the top, and weighs approximately 12,000 lb.

A gondola car is loaded with 6 filled containers in 30 minutes. Bags in the photo are filled with polyethylene, but the containers may be filled with carbon black and other bulk materials.





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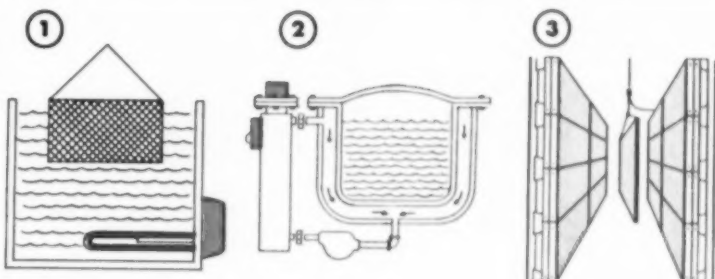
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#### CIRCULATION HEATERS

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#### RADIANT OVEN PANELS

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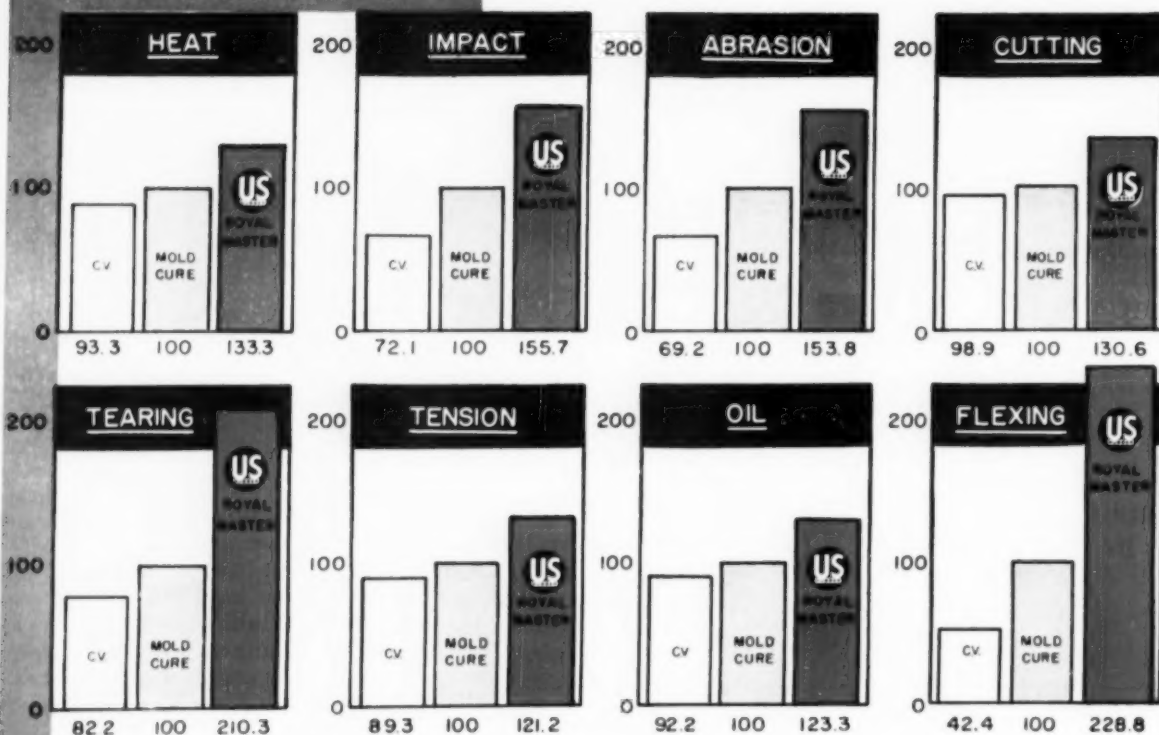
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Comparative performance of portable cords related to major life factors.

Graphs illustrate the outstanding superiority of new U. S. Royal Master Cord — over the average of molded cords and the average of short-lived continuous vulcanized cords of other makes — on every major life factor. (Average of other molded cords is rated at 100%.)



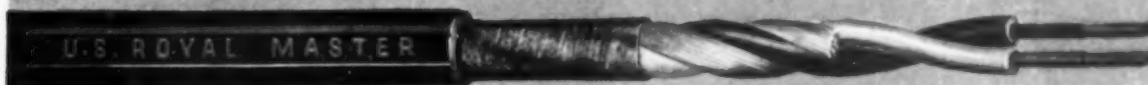
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# MASTER portable cord outlasts all others!

Comparative tests show U. S. Royal Master gives \$1.88 in value for every \$1.00 spent — almost twice the service value of the average of other molded cords!

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Extensive tests, both in the laboratory and in outside plant installations have proved this new portable cord startlingly superior in every respect!

New U. S. Royal Master is unquestionably the finest cord you can buy!

From every standpoint, as the charts at left illustrate, new U. S. Royal Master is a finer, more durable cord—actually gives 88% longer life than the average of competitive molded cords—far longer than *any* other cord—surpassing even a hypothetical cord incorporating the best features of all those tested!

Far greater value, too! In spite of almost doubled service life, this great new cord is in the same price category as other molded cords—giving you \$1.88 in cord value for every cord \$1.00!

Prove to yourself the outstanding superiority of new U. S. Royal Master Portable Cord — in both service life *and* economy! Get in touch with your "U. S." distributor today!

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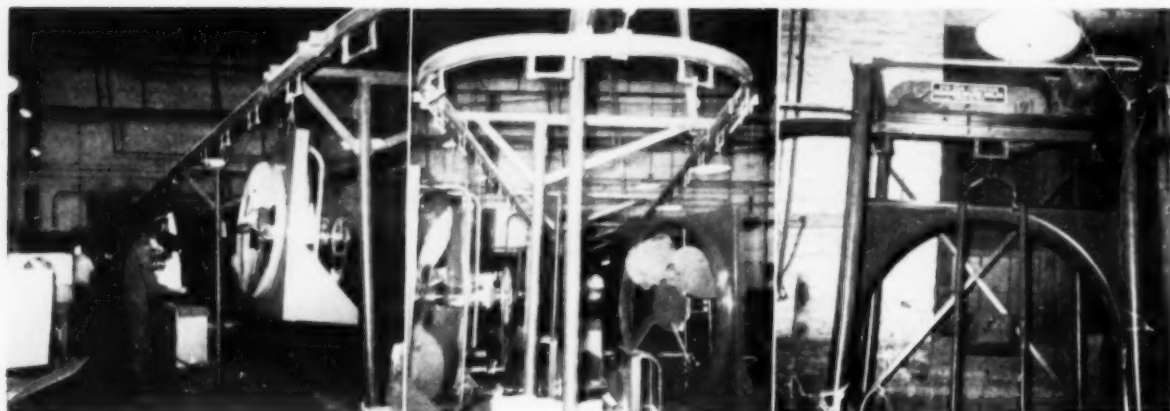
## RUBBER COMPANY

ROCKEFELLER CENTER, NEW YORK 20, N. Y.



INSTALLATIONAL VIEWS  
OF THE  
ZIG-ZAG CONVEYOR

ABOVE: Paint spray booth, drying oven and assembly. Note fan parts on upper portion of conveyor.  
BELOW: Assembly, conveyor take-up and Zig-Zag drive unit.



## Case 21—Georgia Metalworking Plant

### Fan Assembly Operations Conveyorized

**P**RODUCTION was increased 25% after the installation of a Zig-Zag Conveyor, supplied by the Richards-Wilcox Mfg. Co., yet the number of employees required to obtain this production was reduced.

The Murray Company of Texas, in Atlanta, Georgia, manufacturers of attic and window fans, recently completed a modernization program, which completely eliminated the necessity of man handling their product during assembly.

#### Conveyor Data

The basic improvement of their program was the installation of the Zig-Zag Conveyor to carry the

product through its various stages of production. The conveyor passes through the washing, rinsing baths, ovens, painting booth, and over the assembly line. The skeleton frames of the fans are placed on the conveyor, and conveyed through their various stages of production. The fans are not removed from the conveyor until they are completely assembled, and ready for packing.

This method of production has not only greatly increased the output, but has brought about a 30% savings in man hours. Since the painted parts go directly from the paint booth into the drying oven, the area required for production

has been greatly reduced, due to the fact no valuable floor space is required to stack the product for drying.

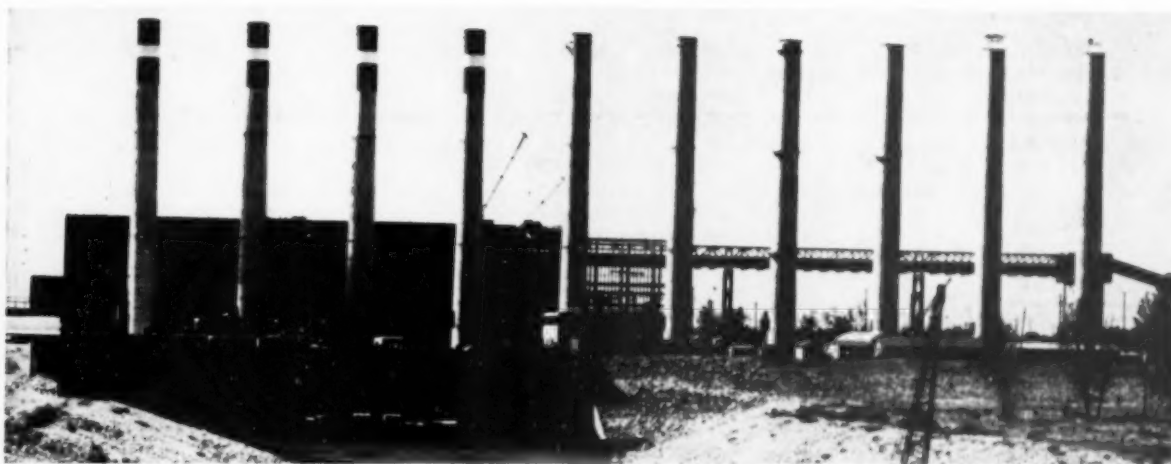
Mr. L. L. Hodges, Industrial Engineer for Murray Company of Texas, states the conveyor paid for itself in less than nine months of operation.

They have had such great success with their present installation, that they are contemplating another conveyor to carry their finished fans to the packing and shipping areas. This conveyor will also be utilized as a storage conveyor. When the new conveyor is added it will eliminate the man who is now moving the fans from the assembly area to the packing area.

Photos by E. J. SWINDEMAN, Manager, Atlanta Dist., Richards-Wilcox Mfg. Co.

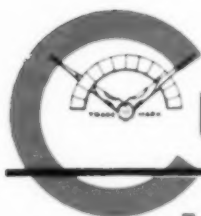


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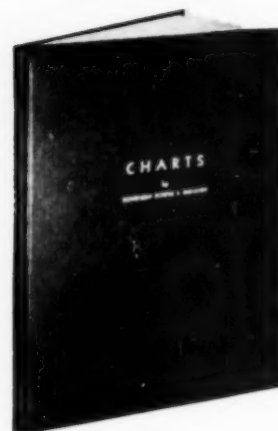
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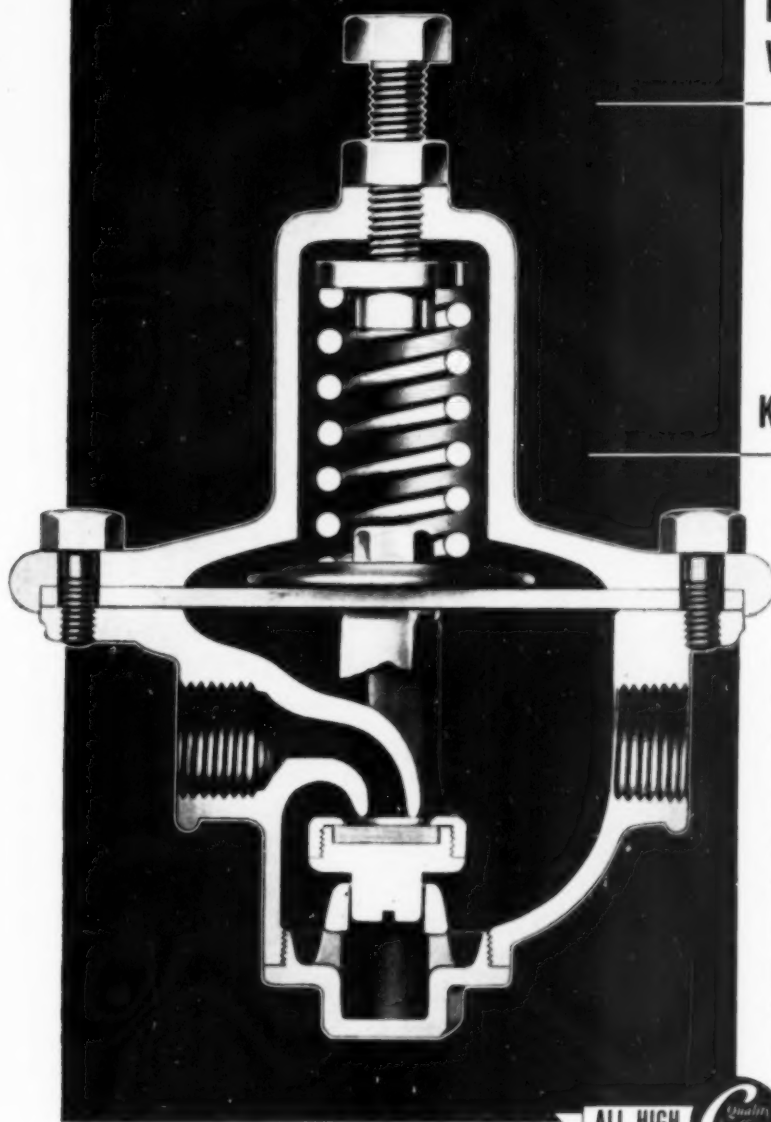
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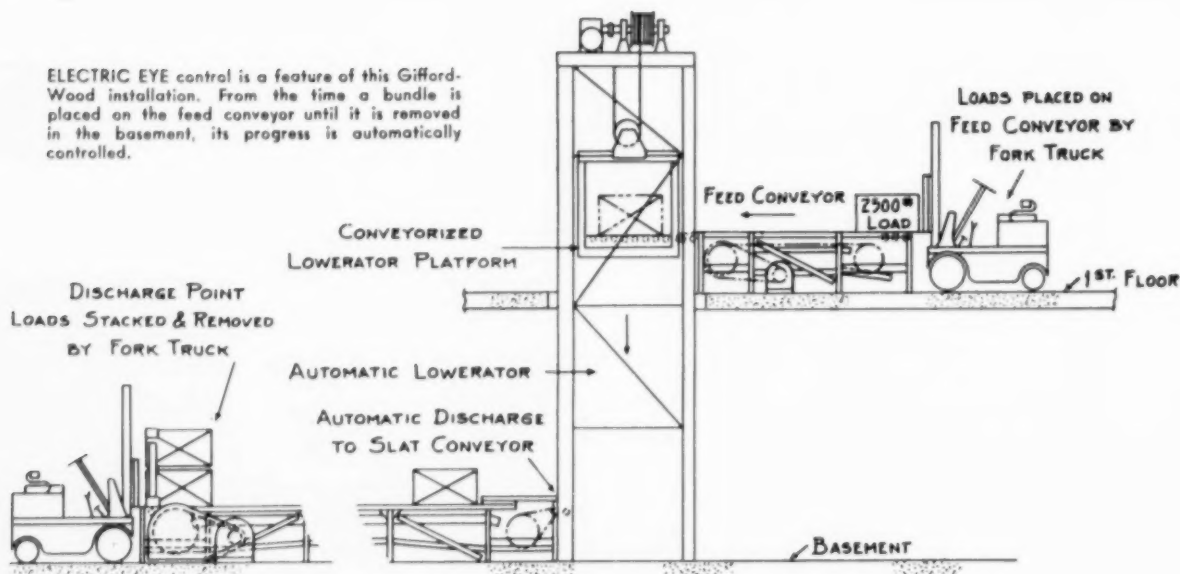


No. 11 for steam No. 71 for air No. 227 for water No. 33 for steam

## MASONEILAN REGULATORS

*Keep Pressure Under Control!*

ELECTRIC EYE control is a feature of this Gifford-Wood installation. From the time a bundle is placed on the feed conveyor until it is removed in the basement, its progress is automatically controlled.



## Case 22—Maryland Metalworking

### Inter-Floor Conveyor Speeds Handling 60%; Fork Truck & Automatic Conveyor Integrated

A VERTICAL conveyor at the Baltimore, Md., plant of the Continental Can Co. cuts tin plate unloading time 66%, frees an elevator, and eliminates a 140 ft fork-truck haul. The vertical conveyor operates **automatically** between the first floor and basement and is fed by a 15 ft slat conveyor on the first floor and discharges to a 60 ft slat conveyor in the basement.

#### Unloading

Over the road trucks bring the tin plate to the plant from nearby steel mills. Each truck carries sixteen bundles weighing from 2000 to 3000 lb apiece. Trucks leave the steel mills at staggered intervals so that one arrives at this Continental Can plant every few minutes. Schedules are determined a day ahead so necessary unloading and storage plans can be made.

Two unloading docks are provided for the unloading operations. Hydraulically controlled toe plates breach the gap between the unloading dock and the truck tail gates. Bundles are removed from

the over the road truck by fork truck and placed on the feed conveyor. As the heavy bundles are removed, the springs of the over the road truck are released and the body of the truck rises. The toe plates automatically adjust to compensate for the resulting difference in height between truck and dock. Under the old system, manually handled non-adjusting

#### More Information Available

Many of these procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case studies are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment manufacturers are identified in the articles. If additional information is desired, contact your local mill supply house, the manufacturer's representative in your area, the equipment manufacturer's headquarters, or write The Editors, SP&I, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.

toe plates were used and they materially cut the life of fork-truck tires.

From the time a bundle is placed on the feed conveyor until it is removed in the basement, its progress is controlled automatically by electric eyes. The horizontal conveyors are of the slat type to support the heavy loads. Slat are formed by bolting the ends of channel sections to two parallel roller chains in such a way that the channel-sides form a flat conveying surface.

The roller chains are supported by structural members as they move the load. The feed conveyor is driven by a 2 hp motor and the basement conveyor by a 7½ hp unit. Both of these drives and the vertical conveyor shaftway are protected by safety guards. The conveyor system was engineered by the Gifford-Wood Company of Hudson, N. Y.

Bundles move up by stages as the basement fork truck takes bundles to storage. The fork truck carries two bundles to storage at a time. It first picks up the bundle which has stopped at the discharge end of the conveyor.

This causes an electric-eye beam to be broken, and the line moves up until there is another bundle at the end of the conveyor. The first bundle is deposited on the second and the two are taken to storage. This moves up the line



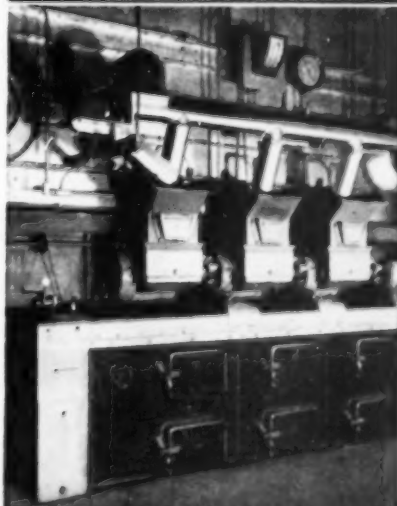
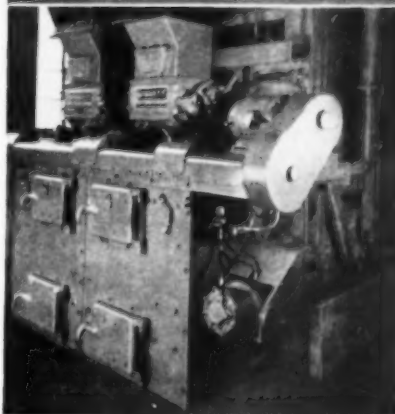
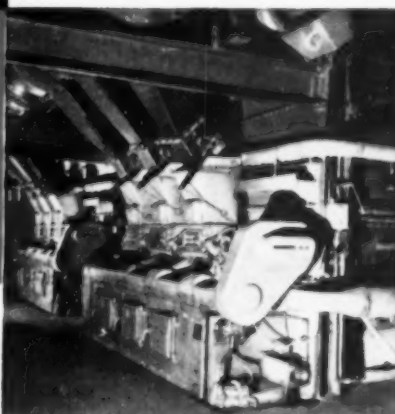
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again and it remains stationary until the unloading truck returns.

The feed conveyor on the first floor is fed by the unloading fork truck as vacancies appear. The feed conveyor carries the bundles to the shaft opening and at this point the bundle breaks an electric eye beam and stops the conveyor. A limit switch is also installed for this purpose should the electric eye fail.

When a bundle is removed from the basement conveyor, electric eyes operate to raise the tray of the vertical conveyor. When the tray is flush with the feed conveyor, the conveyor starts automatically and feeds on one bundle.

The platform of the vertical, or tray conveyor, is made of a section of live-roll conveyor. This live-roll platform is raised and lowered by a  $7\frac{1}{2}$  hp hoist. The

basement conveyor is at right angles to the feed conveyor so the tray of the vertical conveyor is rotated 90° while descending or ascending. This is accomplished by a guide mechanism along the walls of the vertical conveyor.

When the tray reaches the basement with a bundle it holds the load until the basement truck makes a withdrawal and moves up the line. Then it discharges its bundle, by electric-eye control, and automatically rises to receive another bundle.

One fork truck on the ground floor can keep two basement fork trucks busy even though the basement trucks carry two bundles at a time. This is because the basement trucks make long hauls whereas the ground-floor truck merely operates within a few truck lengths.

### Production Advantages

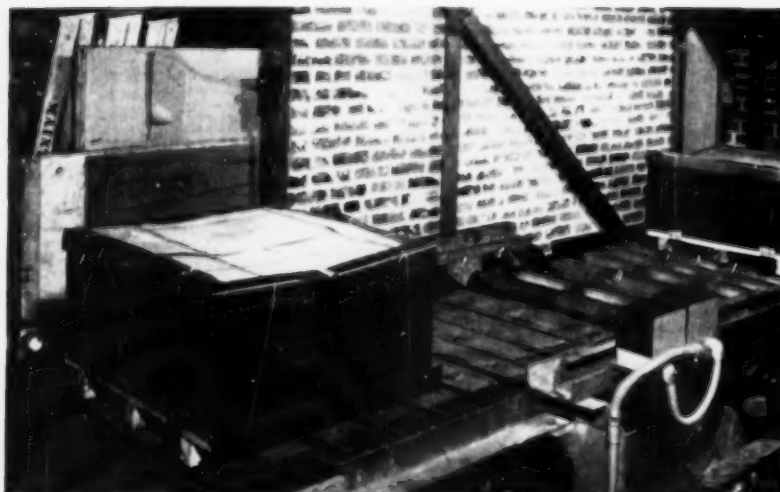
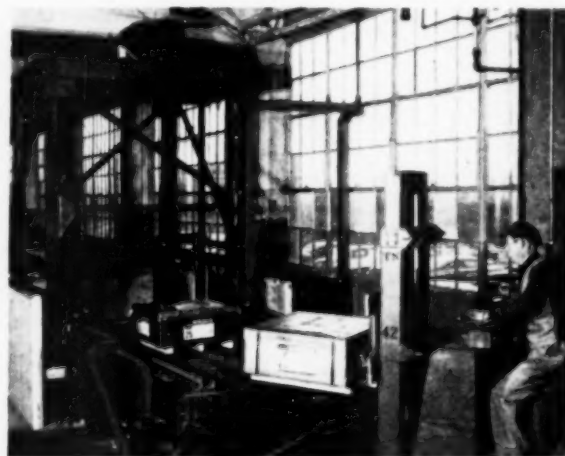
Under the old system, fork trucks on the ground floor had to travel 140 ft to and from the elevator which carried the bundles to the basement. The elevator had capacity for only two bundles at a time. Therefore, bundles often had to be stored temporarily at the elevator entrance. At times two fork trucks were needed to keep up with the incoming highway trucks. It took 30 minutes to unload a truck whereas now the job is done in 10—two bundles a minute plus allowance for unhooking truck chains, etc.

The previous system was both costly and awkward from the viewpoint of flow of materials and making best use of plant space, materials handling equipment, and men.

**RIGHT**—Fork truck takes tin plate from street truck to slat conveyor which feeds vertical conveyor. Electric eye stops bundle at shaft opening.

**BELOW**—Tray of vertical conveyor at basement level waiting to discharge its load. Electric eyes control starting and stopping of slat conveyor and live-roll tray conveyor; also raise the tray.

**BELOW, RIGHT**—Fork truck tiers bundles two high and removes to storage. Electric eye starts conveyor when bundles are removed; stops conveyor when next bundle reaches end. Uppermost electric eye operates conveyor at end of run when there are insufficient preceding bundles to break conveyor operating eyes.



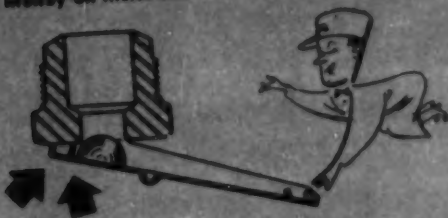
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## Larger Truck Fleet and Pallet-Fork-Truck System Meet Demand for Unit-Load Shipments

WHEN Harbison-Walker Refractories Company opened its new Baltimore, Maryland, plant in 1947, nine electric industrial trucks were adequate to perform virtually all intra-plant material-handling operations.

However, during the past seven years, the number of trucks has doubled. Increased production and greater use of trucks accounted for the need of some of this equipment, but one of the major reasons for fleet expansion has been the increased demand of consumers to have refractory brick shipped in unit pallet loads. More than 50% of the total production is now shipped on pallets with the volume showing a steady increase.

Typical pallet loads of refractories weigh, on an average, 3500 lb each. By far the greater portion is shipped in railroad box cars loaded by fork-lift with a single tier. Because of the weight of the brick, this approaches the load limitations of the car.

### Palletization Problems

Even though the generally rectangular shape, high specific grav-

ity, and friction surface of refractory brick make them well suited for unit-load handling, the development of a workable pallet-shipping program offered problems.

Principal problem was the standardization upon a single pallet size on which loads (1) could be effectively steel strapped, (2) would not exceed the capacity of fork trucks suitable for car loading, (3) would be durable enough for more than one shipment and (4) would accommodate the numerous sizes and shapes of brick which the company manufactures.

This problem, which beset not only Harbison-Walker, but other refractory manufacturers as well, was finally resolved on an industry-wide basis by the Refractories Institute. The pallet adopted as standard for the industry measures 36 by 48 inches, is of single-faced hardwood construction, will accommodate virtually every shape and size of standard refractory brick produced and lends itself well to both carload and trailer-truck shipping.

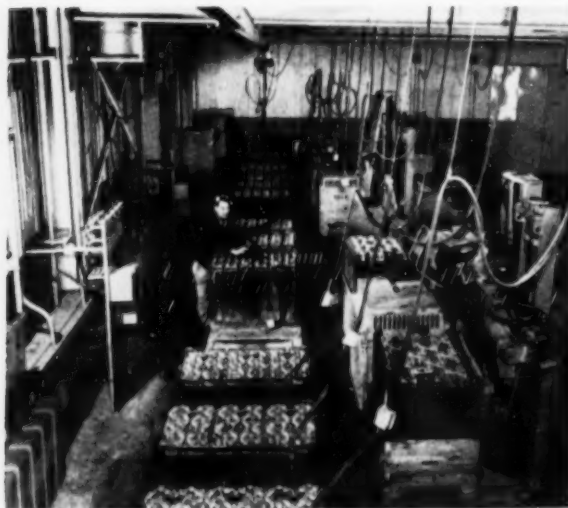
The trucking system has also been widely applied to the unit-load



**PALLET-FORK-TRUCK** system is extensively employed for handling in production and storage.

handling of material at receiving, in storage and in process.

In-process handling involves both "fired" brick (brick subjected to intense temperatures in tunnel kilns) and "chemically bonded" brick (brick dried in dryers at relatively low temperatures). In the manufacture of the chemically bonded brick, the plant fabricates steel "casings" in which the brick is encased to form "Metalkase" brick. Power trucking is used exclusively for handling this steel from receiving through progressive production operations. Pallet-to-pallet handling is extensively

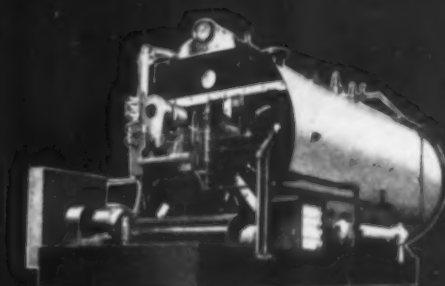
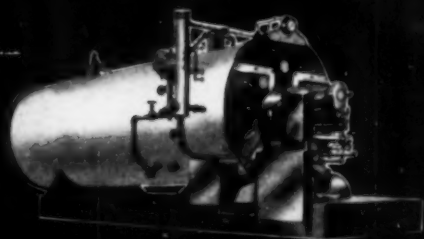


**BATTERY SHOP** features in the Baltimore plant include: (1) forced-draft-ventilated charging benches, (2) a mono-rail-mounted power hoist providing coverage of all bench spaces and the truck aisle and (3) pulleys and counterweights to keep charging leads out of the way when not in use.

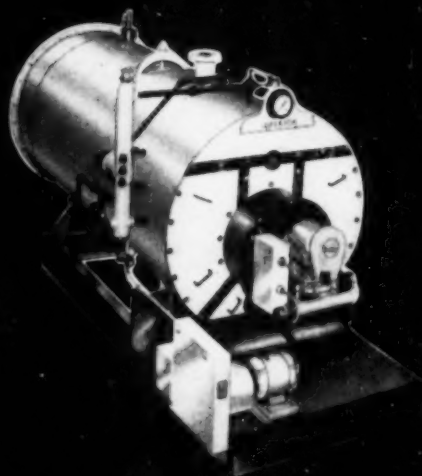
**COMBINATION** of high summer temperatures, high ambient temperatures in the plant and the volume and weight of the loads, resulted in electrolyte temperatures higher than the recommended maximum of 115 F. Problem was solved by applying forced-draft ventilation to cool the batteries during the time that they are on the charging benches.

Two charging benches, each accommodating eight batteries, are boxed in with sheet metal. Ports at each charging location on tops of benches and felt-faced closures seal off the bench locations when they are not in use. Blowers are located at one end of each bench. During non-operating and charging intervals, batteries are cooled by air, forced vertically, between the cells—thus bringing electrolyte temperatures down well within safe operating range. During the winter months system is not operated.





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**SUPERIOR**  
STEAM GENERATORS

employed in all production operations throughout the plant.

The pallet-fork-truck system is also employed to carry, store and ship fired brick, which make up the remainder of the plant's output. The brick is fired on kiln cars in continuous-tunnel kilns. Following cooling it is moved on tracks to unloading platforms where the brick is sorted, by type and size, onto the standard wooden pallets. Loaded pallets are tiered four-high in the storage areas together with the chemically bonded brick on its steel pallets.

All of the electric industrial trucks in use at Harbison-Walker's Baltimore plant are powered by Edison Nickel-Iron-Alkaline Storage Batteries. These were initially adopted as standard because of their dependability and ability to withstand rough treatment. Another advantage which makes the batteries well suited to this service is the fact that they can be cooled rapidly during offshifts.

#### Case 24—Florida

### Tunnel Speeds Handling

**T**O FACILITATE transportation of quick frozen concentrate from the freezing tunnel to a cold storage plant located about 400 ft away but on the opposite side of six railroad tracks, a tunnel was successfully built and used.



This tunnel was built of Armco Liner plates without interruption of rail traffic on the double track

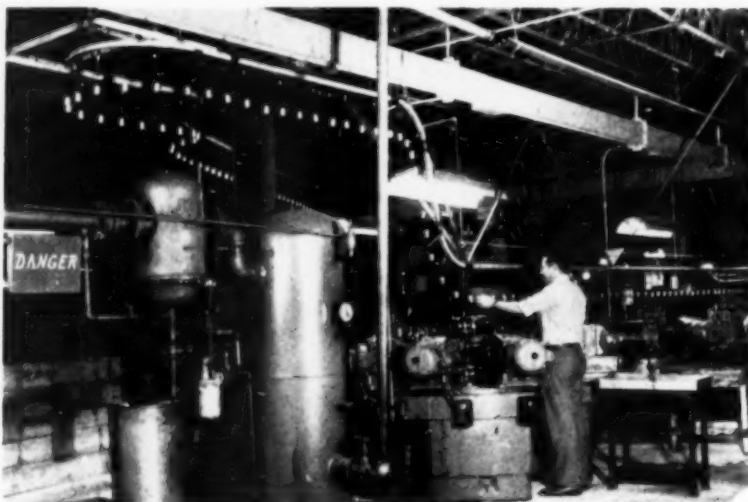
Atlantic Coast Line. The tunnel spans the double track main line and four railroad sidings within the plant of Pasco Packing Co. of Dade City, Florida.

This tunnel is only about 250 ft long but is lengthened by bricked up extensions at both ends. While the packaging machinery is only about 400 ft from the center of the cold storage warehouse by tunnel, the distance traveled formerly to move the product was over a third of a mile. Crossing the railroad tracks also caused delays due to passing or switching trains and frequent spilling of pallet loads of frozen concentrate.

Tow-motors and trailers were formerly used, and six pallet loads of concentrate were hauled at one trip. Temperatures increased, rains caused delays and the whole operation was unsatisfactory and expensive.

The tunnel facilitates moving one pallet load at a time by fork-lift tractor without delay of any kind. The use of the Armco Liner Plates did not require open-cutting of the tunnel but because of special design was installed in eighteen inch lengths and bolted from the inside.

By A. T. LOHKAMP, Plant Engineer,  
Pasco Packing Co., Dade City, Florida



#### Case 25—Metalworking Plant

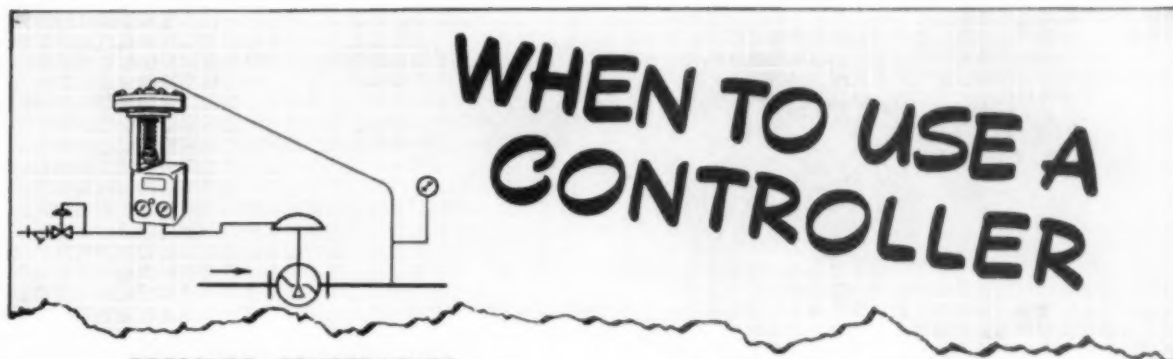
### Chainveyor Improves Small Parts Handling

**T**HE improved handling equipment in this plant is an excellent example of the continuous-flow principle of handling materials and demonstrates the value of getting materials to processing machines and away from them in smooth, orderly fashion.

**Problem:** To deliver fuse ends for 75 and 155 mm shells to trimming, drilling, tapping, and boring machines and to inspectors.

**Solution:** 335' long light duty Mathews overhead trolley conveyor with 62 curves, 2 drives, and a speed of 5 to 15 feet per minute.

**Results:** There has been a substantial increase in production, and congestion and confusion created by the use of parts baskets have been eliminated. Each operator handles about one ton less of weight per man per day than under previous conditions. Workmanship has improved, since each operator concentrates entirely on performing his particular job well rather than upon getting the right materials to his machine and away from it.



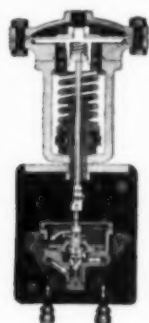
## PRESSURE, TEMPERATURE AND LIQUID LEVEL CONTROLLERS

**Leslie Controllers** consist of a single or double seated diaphragm control valve operated by a Control Pilot. The latter is an air, water or oil actuated device that produces a variable loading pressure to the valve diaphragm in response to a pressure, temperature or level change in the controlled medium. Controllers are used for any one or any combination of the following conditions:

- ★ When an exactly controlled level, pressure or temperature is required.
- ★ When power is needed to assure automatic valve open-

ing after prolonged, tight shut-off.

- ★ When power is needed to operate single-seated valves under high pressure drop.
- ★ When the available fluid pressure differential doesn't supply enough power for self-operation.
- ★ When extreme pressure reductions are necessary (i.e. 600 reduced to 10 psi, 900 to 2 psi, 2150 to 5 psi); all can be handled in one step.
- ★ When fluid contamination requires the simplest type regulating valve for dependable operation.
- ★ When operation from either a nearby or remote control station is desired.

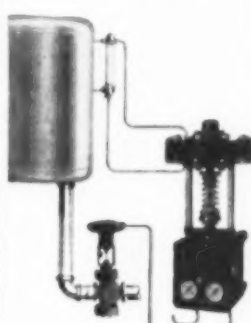


Control Pilot  
Type PD

### LESLIE CONTROL PILOTS

Simple mechanical device employing constant supply of clean air, gas, water or light oil at 20-22 psi to produce a variable output or loading pressure of 0-20 psi in response to a level, pressure or temperature change applied to operate a control valve or power cylinder controlling fluid flow.

SEND FOR BULLETIN 5303



Floatless Level Control  
Type UA-1

### LESLIE FLOATLESS LEVEL CONTROL

Provides accurate control of liquid level (plus or minus 1" water column). Eliminates problems caused by troublesome linkages, torque tubes, floats and stuffing boxes. Simple design provides steady, positive, precise control even under difficult conditions. Consists of Level Control Pilot and diaphragm control valve.

SEND FOR BULLETINS  
5303, 5304, 5305

### LESLIE DIAPHRAGM CONTROL VALVES (Double Seated)

Flow-line contoured body for high capacity, low pressure drop. Standard ISA face to face dimension in cast iron, cast bronze and cast alloy steels. Renewable, self-aligning guides.  $\frac{1}{2}$ -10". To primary service rating of 600 psi-950° F. flanged, ring joint and welding ends.

SEND FOR BULLETIN 5305

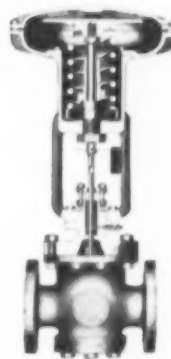


Diaphragm Control Valve  
Double Seated Class DV

### LESLIE DIAPHRAGM CONTROL VALVES (Single Seated)

Control flow of steam, liquid, air or gas. Tight shut-off. Operated automatically by air, water or oil pressure supplied from a Control Pilot or from a loading device such as LESLIE Air Loading panel. Available in unbalanced or fully balanced types,  $\frac{1}{2}$ -10" in cast bronze, cast iron and cast alloy steels. Primary service ratings to 2500 psi, 1000° F.

SEND FOR BULLETIN 5304



Diaphragm Control Valve  
Single Seated Class DL-1

# LESLIE CONTROLLERS

SINCE 1900

"STILL FAR AHEAD IN QUALITY AND PERFORMANCE"

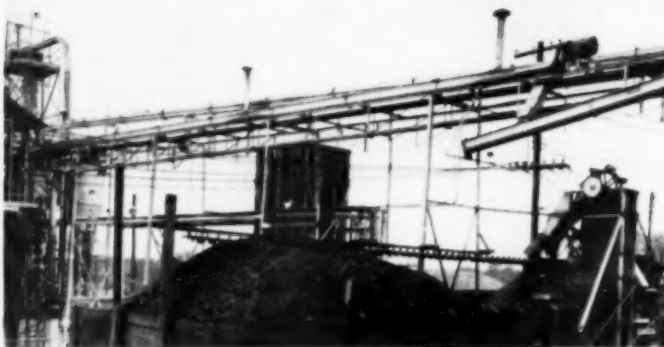
LESLIE CO., 261 GRANT AVENUE • LYNDBURST, NEW JERSEY

## Case 26—Louisiana

### Mechanized Handling

**T**HE Shaw-Box Crane & Hoist Division of Manning, Maxwell and Moore, Inc., is well represented at the Chalmette, La., Works of the Kaiser Aluminum & Chemical Corporation which is the largest aluminum reduction plant in the U. S. This plant has 21 Shaw-Box type "SB" heavy duty cranes ranging in capacity from 10 to 40 tons with lighter capacity auxiliary hoists.

At the Chalmette plant there are 16 pot rooms. Each pot room is 960 ft long and contains a 20-ton crane with a 10-ton auxiliary hoist. These cranes are used for servicing the pots and tapping off the molten metal, and for transporting the ladles of molten aluminum to the metal service building.

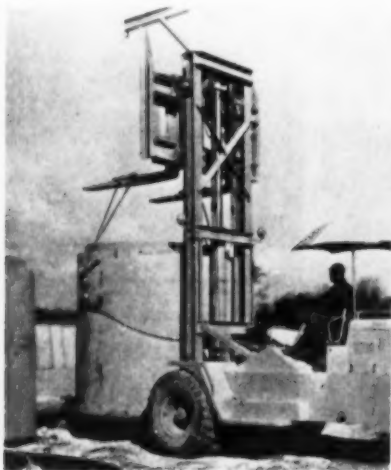


## Case 28—Alabama

### Versatile Multiple Spiral Conveyors

**T**HESE multiple spiral conveyors perform several functions in this Jeffrey Manufacturing Co. equipped Alabama peanut plant. Conveying units handle 60 to 70 tons for a 24 hour day.

Open spiral conveyor over the storage bin levels off the peanut shell storage. Overhead enclosed spirals convey bulk materials through the plant's processing system, saving much time and money as well as keeping the product clean.



## Case 27—Tennessee

### Fork Trucks Speed Handling of Concrete Pipe

**H**IGH-CAPACITY fork trucks are utilized for rapid movement of heavy concrete pipe joints from manufacturing to yard storage facilities and shipping points at the Sherman Concrete Pipe Company, Knoxville, Tenn. Company officials say use of the ma-

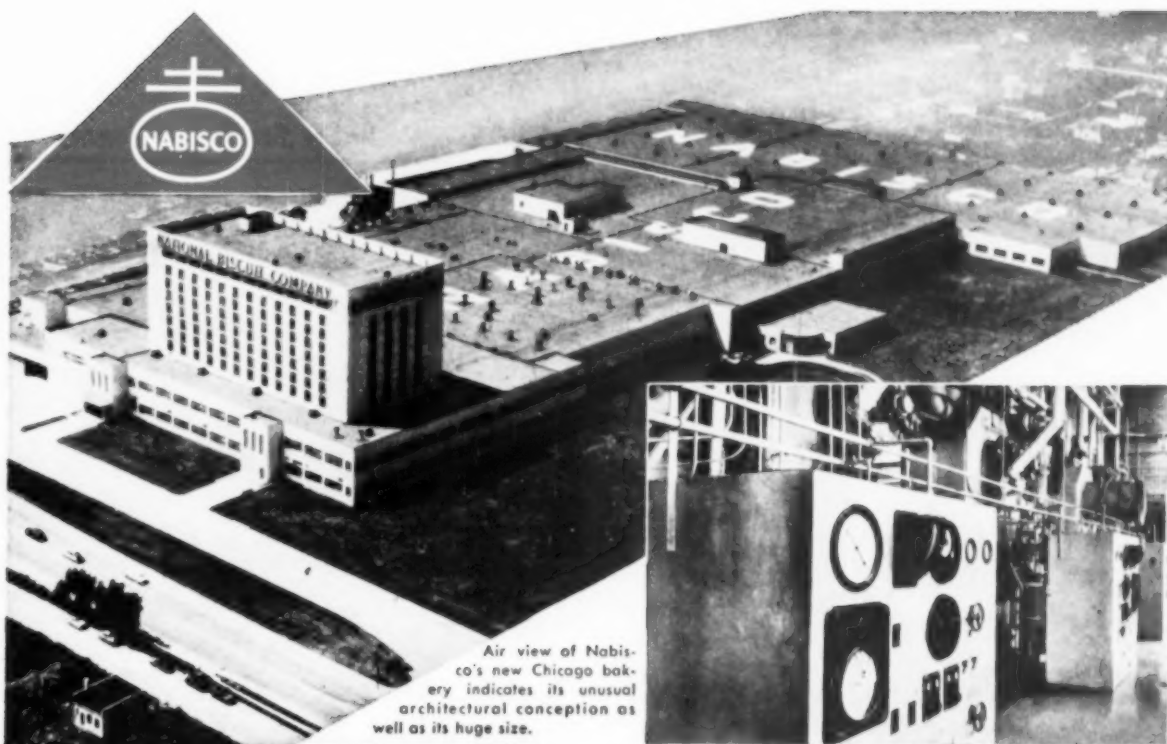
chines has released from eight to ten men for more productive jobs in the plant.

The company produces pipes in sizes ranging from 10" to 84" in diameter and up to 96" in length, with the largest joint weighing 20,000 lb. Common sizes are 18"

diameter pipe weighing 604 lb and 66" diameter pipe weighing 7990 lb.

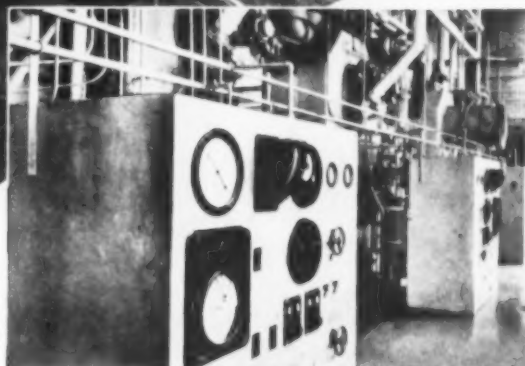
Handling these heavy joints is a job for three Clark-Ross fork trucks of 26,000 lb, 15,000 lb and 10,000 lb capacities. A boom and cable arrangement on the large truck enables it to remove 20,000 lb joints from forms. When the pipes are on their sides, regular forks are inserted through the center for quick handling. Smaller pipe joints are handled seven at a time by multiple fork attachment.





Air view of Nabisco's new Chicago bakery indicates its unusual architectural conception as well as its huge size.

**keeping steam cheap . . .**



B&W Integral-Furnace Boilers, Type FM, in service at Nabisco. Delivered completely shop-assembled, FMs are ready to skid or lift into position, connect to services, and place in operation.

## World's Largest Bakery

served by **3** B&W Integral-Furnace Boilers, Type FM

Typical of the increasing demand for the B&W Type FM Boiler was the choice of a multiple-unit installation for the largest, most modern bakery in the world, capable of producing 167 million pounds of baked goods annually. Occupying 12 acres of a 45-acre site, National Biscuit Company's new Chicago bakery is an outstanding example of scientific application of straight-line mass production methods combined with the highest standards of cleanliness and sanitation, and striking architectural beauty.

Since January 1952, the three FM units have been generating steam for heat, hot water, and various processing operations, such as melting shortening for easier unloading from tank cars and to facilitate its distribution within the plant.

Designed to produce 25,000 lb of steam per hr each at 110 psi pressure, the B&W Units are oil-fired—make a positive contribution to the elimination of smoke and fly ash required by Nabisco. Choice of the three FM boilers rather than a single, larger unit resulted after careful consideration of all factors and a realization that the FM unit offers the benefits of "package" steam combined with many cost-saving big-boiler advantages.

### COST-SAVING FEATURES of the B&W Type FM Boiler

- Saves Erection Time and Cost
- Meets Wide Range of Service
- Handles Quick Load Changes
- Fast Steaming
- Low Maintenance
- Easy Accessibility
- Suitable for Outdoor Service
- Burns Oil and/or Gas
- Saves Fuel
- Saves Space
- Safe, Automatic Operation

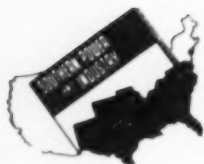
Satisfaction with the performance of the B&W Type FM Boiler is proved by the number of units in service and on order for industries, utilities, and other users in practically every category. In terms of total steam capacity they add up to about 9,000,000 lb per hr, and better than half of this capacity is in multiple-unit installations. The compact, shop-assembled FM is available in standard sizes for loads ranging from 2900 to 36,000 lb per hr at steam pressures to 235 psi—is also available for higher pressures.

Bulletin G-76A describes in detail the many cost-saving features of this self-contained, popular small boiler. Write for your copy. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd St., New York 17, N. Y.

G-642



BOILER  
DIVISION



## Section 4

# Plant Services

### Case 28—Georgia

#### Chemicals Saved and Waste Eliminated

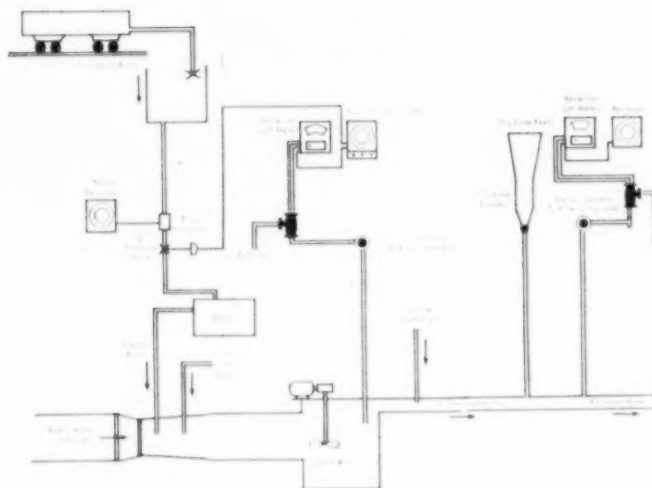
WHEN the pH of water is too low, iron water mains oxidize. A rush of water through the pipes causes these iron oxides to break loose, giving the water a rusty or red color. This contaminated water is commonly known as "red water." Macon Water Works, Macon, Georgia, which processes 15 to 16 million gallons of water per 24 hour day, faced the problem of eliminating this disagreeably colored water in order to assure a pure, clear product for its consumers.

**Former Method** — Previously, mechanical feeders were employed for the addition of dry alum and lime. Alum is added to the water to remove solid impurities with a resulting decrease in pH. Lime is then added to raise the pH and thus prevent formation of red water. When too little alum is added, the water tends to be cloudy. When too little lime is

added, red water results. With the employment of mechanical feeders, pH was checked every two hours and the feeders were set according to the most recent pH measurement. Due to lags and varying demand, this procedure resulted in wasted materials and only partially effective control.

**New Technique**—Beckman Automatic pH Meters with recorders and controllers were installed at Macon Water Works to prevent cloudiness and to solve the red

water problem. The pH meters and recorders are mounted on a panel in the chemical room. Electrode sets are supplied with continuous samples drawn from control points after the introduction of alum and lime. Automatic addition of liquid alum and chlorine depresses the raw water pH of 7.6 to a control range of 6.4 to 6.6 and maintains the value to within 0.1 pH unit. The alum causes suspended material in the water (e.g., colloids, dirt, bacteria, color form-

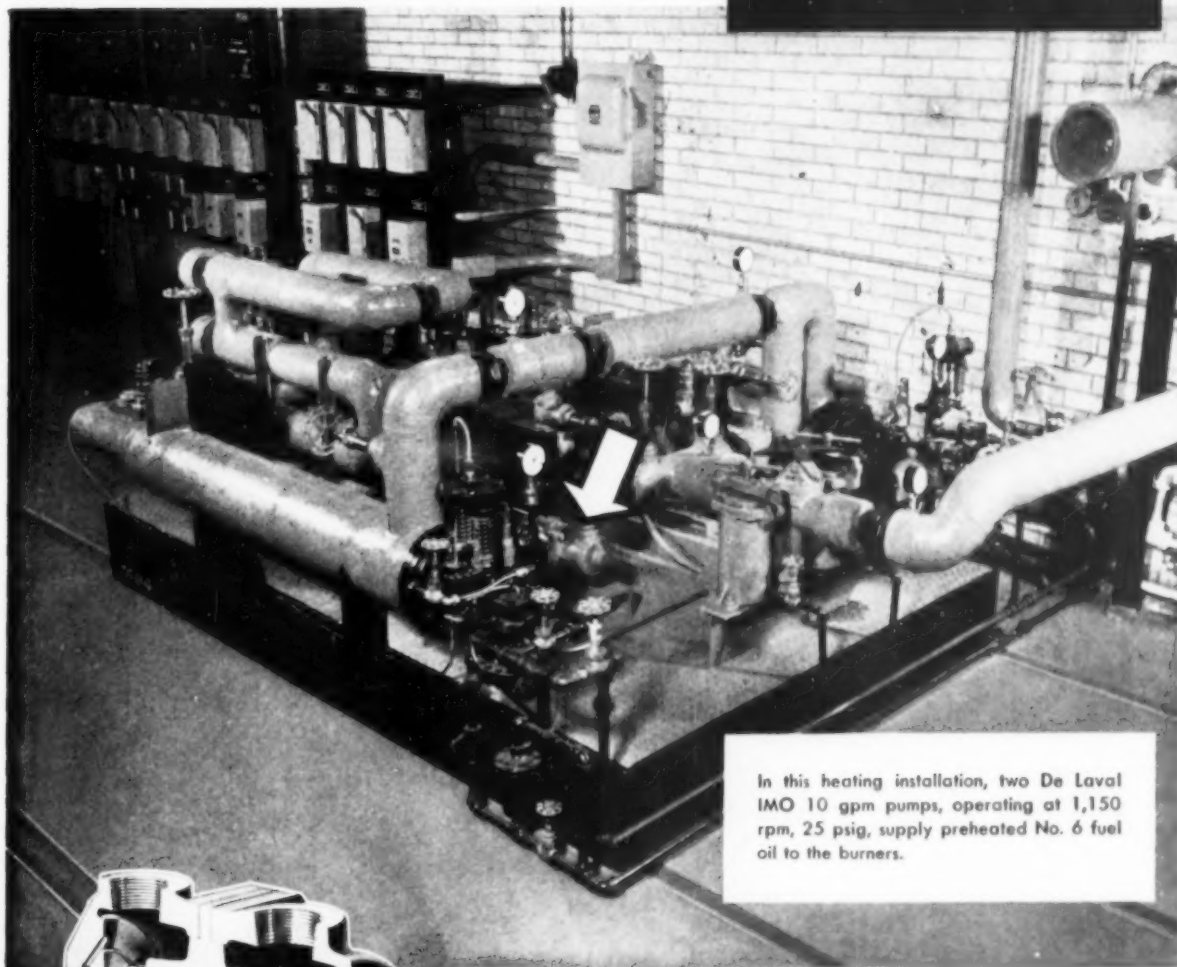


Flow Diagram, Macon Water Works, Macon, Georgia

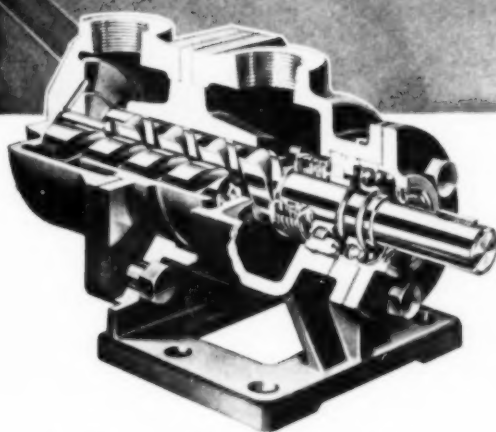
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when you install dependable*

**DE LAVAL**

**IMO PUMPS**



In this heating installation, two De Laval IMO 10 gpm pumps, operating at 1,150 rpm, 25 psig, supply preheated No. 6 fuel oil to the burners.



A wide range of De Laval IMO models specifically built for fuel oil service is available. Capacities up to 80 gpm, pressures to 275 psig. Write today for Bulletin LG-A.

To increase your present—and future—profits on commercial heating jobs, install *dependable* De Laval IMO pumps on pump and heater sets. Their simple, trouble-free design saves you money on service calls... builds customer goodwill, for there's nothing to get out of order or need adjustment. No pilot gears, no sliding vanes, no reciprocating pistons. De Laval IMO's have only three moving parts—smoothly intermeshing rotors that propel the fluid axially in a steady flow without churning, pocketing or pulsation.



**DE LAVAL** *IMO Pumps*

DE LAVAL STEAM TURBINE COMPANY  
817 Nottingham Way, Trenton 2, New Jersey

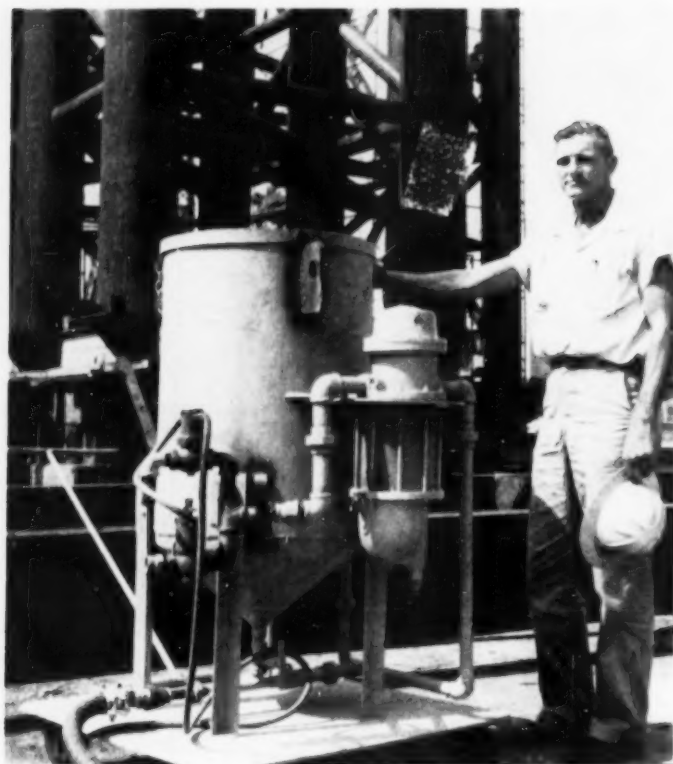
ing bodies, etc.) to coagulate and form a floc or voluminous precipitate.

After passing through settling basins where the floc precipitates, the water is further treated with dry lime by a Beckman pH controlled system to bring the pH to 8.5. Water in this slightly alkaline condition is relatively non-corrosive to iron mains. Thus, it is received clear, colorless and uniform in quality by the user.

**Results**—Estimated savings in alum alone have amounted to \$1500 per year. Alum and chlorine consumption were each cut 50%.

Turbidity of the water supplied to the filter has been reduced from 8-12 ppm to 1-2 ppm, permitting substantial savings in wash water.

Solution of the red water problem by automatic control has eliminated the waste of 100,000 gallons of "blow off" water per day. Prior to automatic control, it was necessary to draw off water from the fire hydrants in an attempt to eliminate all colored water. This process required one man almost full time. The water loss was particularly serious in the summer months, when water was in shortest supply.



Bob Flautt, Jr., is shown here by a Wilkerson Separator mounted on a 1 1/2" air line serving a sand blast machine.

#### Case 29—Louisiana

##### Moisture Eliminated

UNTIL recently the moisture laden air of New Orleans' Lake Pontchartrain area has been a headache to Higgins, Inc. The famous boat building firm was experiencing sharply reduced air

tool efficiency on about 300 air driven hand tools and a large number of paint spray guns.

"We are getting into heavy steel fabrication for oil prospecting equipment," says Bob Flautt, assistant manager of the steel division, "and of course rust formation cannot be tolerated in our sand-blasting process. We must have absolutely dry air prepara-

tory to applying molten metal. The slightest moisture content, especially likely in our humid climate, will cause rust. The use of Wilkerson separators has eliminated this problem."

Twenty Wilkerson Corporation separators, including four new two-inch units, have been installed on tanks and air lines, with more installations planned according to Higgins management. The metalizing process referred to by Bob Flautt is but one of many requiring clean dry air at the Higgins plant.

Six of the separators are diaphragm operated line drains. Four are float operated sump drains, seven are large float operated line drains, one is a tank drain and there is one Higgins truck equipped with Wilkerson diaphragm operated tank drain and control governor and filter. Some of these have just been installed, with no test results yet available. Flautt says, "Under our present program we are using some 2300 cfm of free air and are pleased with the new separators which indicate a healthy gain in efficiency on our air tool operations."

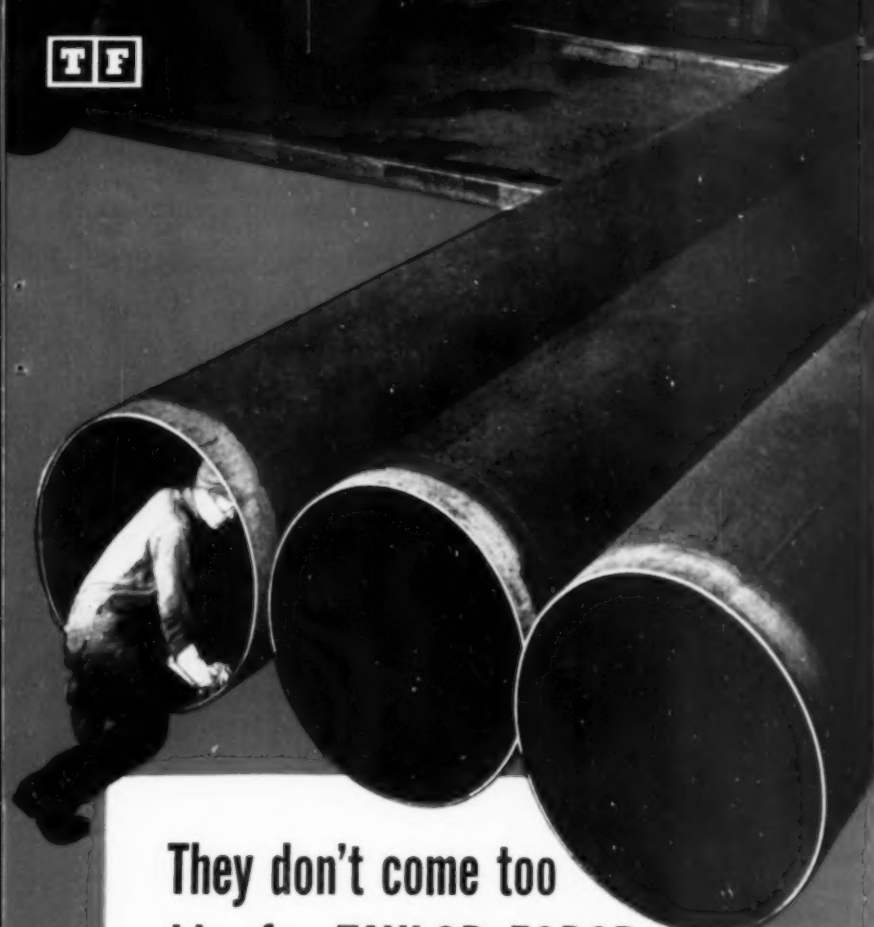
#### Case 30—Florida

##### Low-Cost, Odorless Protective Coating

A LARGE reinforced concrete reservoir, part of Miami's Alexander Orr, Jr., Water Treatment Plant, required a low-cost protective coating because of tremendous area involved. Yet the paint could not impart taste nor odor to the drinking water. The paint had to be a long-lasting one because of the labor involved in painting such a large installation and because shut-down time for repainting had to be pushed far into the future.

Engineers for the City's Department of Water and Sewers chose Inertol No. 49 as a prime coat and Inertol No. 49 Thick for the two finish coats (Inertol Co., Inc., Newark, N. J.). These black, asphaltic coatings have long service records.





## They don't come too big for TAYLOR FORGE

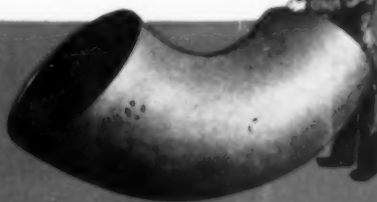
As pioneers in the making of heavy-walled large-diameter pipe, it is not surprising that Taylor Forge has developed the widest range of large welding fittings and flanges like those illustrated here.

In fact, those who know the background of Taylor Forge insist on the WeldELL<sup>®</sup> line for all requirements from smallest to largest. They have found that WeldELLS have features which are combined in no other fittings for pipe welding.

See your Taylor Forge Distributor for up-to-the-minute facts.

## TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS • General Offices and Works:  
P.O. Box 485, Chicago 90, Illinois • Offices in all principal cities  
Plants at: Carnegie, Pa.; Fontana, Calif.; Gary, Ind.; Hamilton, Ontario, Canada



### The pipe was farther along than the auto!

They made their automobiles high in the days when this photo was taken at the old Taylor Forge Works, and that's why Taylor Forge chose this way of demonstrating the largest heavy-walled pipe the world of 1916 had ever known.

As a matter of fact, the pipe was farther along than the automobile, for Taylor Forge had started the manufacture of this large pipe as early as 1907. Before then, pipe had been just a tube for conveying fluids, but by 1907 there was a widespread call for large, rated pipe to withstand widely varied and exacting services.

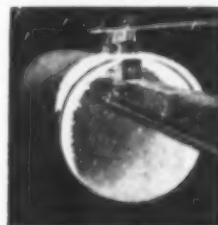
Taylor Forge responded to this call. In pioneering forged steel flanges, Taylor Forge had learned a lot about forging technique and piping practice...and both schoolings were prerequisite to the new venture. The projected large diameter pipe was to consist of heavy plate rolled into shape, then hammer lap welded to a smooth, sound weld. This called for heavy, specially designed equipment to make the process work and to provide the first smooth interior pipe and pressure vessel cylinders produced in this country.

Typical of the pioneering obstacles was the need for a clean flame to prevent scale forming at the weld, but this problem was solved when Mr. J. Hall Taylor designed and installed a large water gas plant that provided the desired welding conditions.

Thus it was that by 1916 Taylor Forge was making pipe up to 96"; forging all types of end joints on it; engineering it and prefabricating it into hydro-electric penstocks; laterals and Y's for pumping stations, pipe lines, and for similar applications all over the world.

Since the introduction of automatic metallic arc-welding this large pipe has been produced as "Taylor Straight Seam Electric-Weld Pipe," but there are hundreds of miles of the old "Taylor Hammer Lap Welded Pipe" still giving as good service as it did the day it was installed.

### An episode in the story of Taylor Forge leadership in designed piping



This old painting—the original in full color—depicted the original process of making Taylor hammer lap welded pipe.

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For faster service and more economical production, Campeco offers Southern industry convenient, modern facilities for metal stamping . . .

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**DRAWING      FORMING      EMBOSSING**  
**ASSEMBLY      FINISHING**

Our Design and Engineering Department, with years of experience, are glad to help you

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- recommend ways to improve your present product
- assist you in getting faster service and maximum economy on your standard parts.

All work is done in our modern plant, located in the heart of the industrial South. Consultation, quotations, and complete information available on request.



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**CAROLINA METAL PRODUCTS, INC.**  
BOX 3636      CHARLOTTE, NORTH CAROLINA

## Plant Services (Con't)

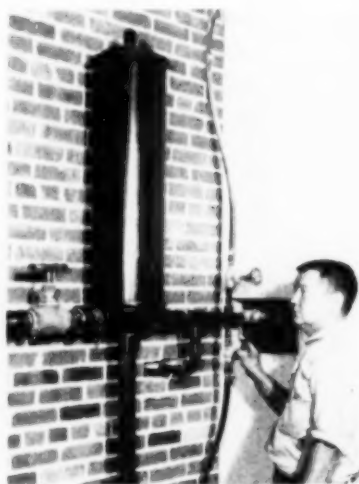
### Case 31—Tennessee

## Filtration Technique Improves Process Water

**T**HE American Lava Corporation of Chattanooga, Tennessee, filters its intake of regular city water to eliminate micronic solid particles from their process water. As manufacturers of technical ceramic products, no contaminant causing a reduction of the dielectric properties of their products can be present in their mixes.

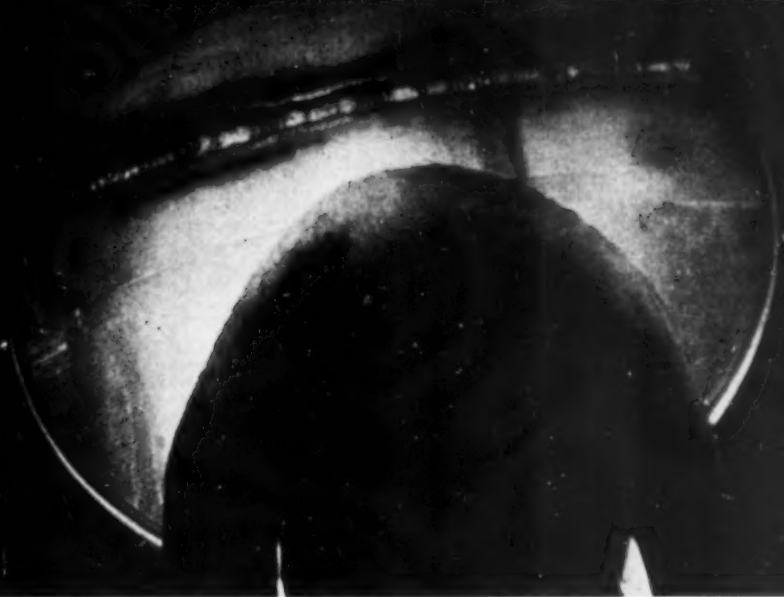
One source of contaminants had been their regular city water which compares favorably with other cities. In spite of this quality, however, sand, grit, rust, etc., were present in minute quantities. To eliminate all traces of these micronic particles a Micro-Klean replaceable cartridge filter, manufactured by Cuno Engineering Corporation, was put on the water line. Unit incorporates 10-micron density cartridges. Since the original installation was made, other units have been added.

American Lava Corporation reports that maintenance upkeep of the filters on this application is a minor expense.



ONE of several Micro-Klean filter installations at American Lava Corporation's Chattanooga, Tennessee, plant.

# Consider the unique K-weld technique... when critical piping is the order!



View of inside of pipe, showing root bead. Note the highly uniform, crack-free surface obtained through use of K-Weld method.

With today's operating conditions already approaching the limits of available power piping materials, the necessity for expert fabricating techniques cannot be overstressed. And it is here that the K-Weld\* process, Kellogg's unique welding method, has already played an important part.

For example, K-Weld was used throughout—both in the shop and in the field—for the welding of austenitic stainless steam piping for service at 1100 F and 2350 psig on two 145,000 Kw units in Kearny Station of Public Service Electric and Gas Co. of New Jersey. It is also being employed in the critical piping for a similar unit at the Company's Burlington Station.

Main advantage of this new welding process lies in the fact that it assures complete penetration without backing rings. Their elimination precludes the possibility of crack propagation at the weld root which would produce ultimate failure as a result of severe operating conditions.

An additional advantage is the elimination of the possibility of the backing ring breaking off and damage-

ing equipment. Furthermore the lack of a ring materially reduces turbulence in pipes.

The K-Weld process—developed in Kellogg's Welding and Welding Practices Group—entails the use of inert-gas arc welding of the first pass with inert-gas under controlled pressure on the inside of the piping. It permits an average welder qualified for inert-gas arc welding to obtain excellent results either in the field or in the shop. The K-Weld technique may be used on all power piping materials.

Fundamental development work leading to advances in the art of fabrication is an important part of Kellogg's basic stock in trade. Many power station designers and utility companies also say it's one basic reason why they time and again specify Kellogg when critical power piping is the order.

**New Power Piping Booklet Published...** Send for descriptive literature about Kellogg's extensive facilities for assuring the highest quality workmanship. A section of the booklet is devoted to detailed coverage of the K-Weld process.

**OTHER FABRICATED PRODUCTS include:** Pressure Vessels . . . Vacuum Vessels . . . Fractionating Columns . . . Drums and Shells . . . Heat Exchangers . . . Process Piping . . . Heads and Headers . . . Forged and Welded Fittings

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- Societa Edison (Italy)
- Societe Financiere De Transports Et D'Entreprises Industrielles (Sofina) (Belgium)
- Societa Meridionale Di Eletticitita (Italy)
- Sociedad De Electricidad De Rosario (Argentina)
- Union D'Electricite (France)

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### THE M. W. KELLOGG COMPANY

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HIGH  
TEMPERATURE

HIGH  
PRESSURE

POWER  
PIPING



HIGH  
TEMPERATURE

HIGH  
PRESSURE

POWER  
PIPING



HIGH  
TEMPERATURE

HIGH  
PRESSURE

POWER  
PIPING



HIGH  
TEMPERATURE

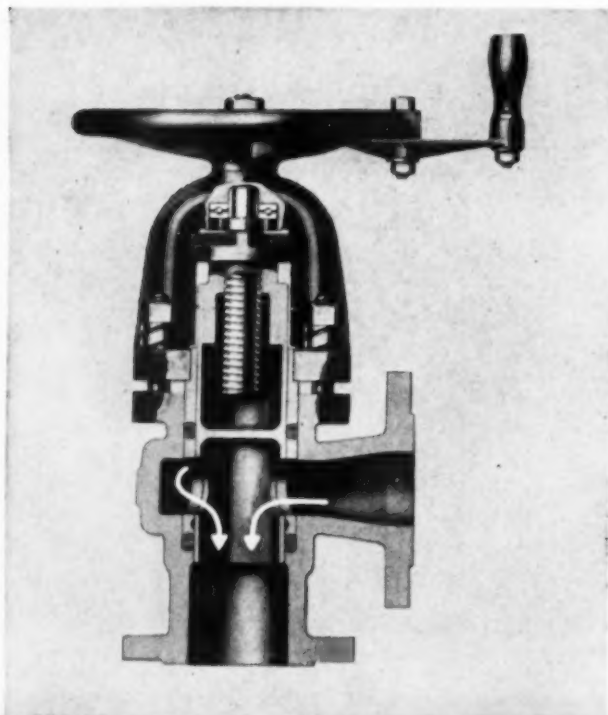
HIGH  
PRESSURE

POWER  
PIPING

# **These YARWAY VALVE DESIGNS**

## **YARWAY SEATLESS**

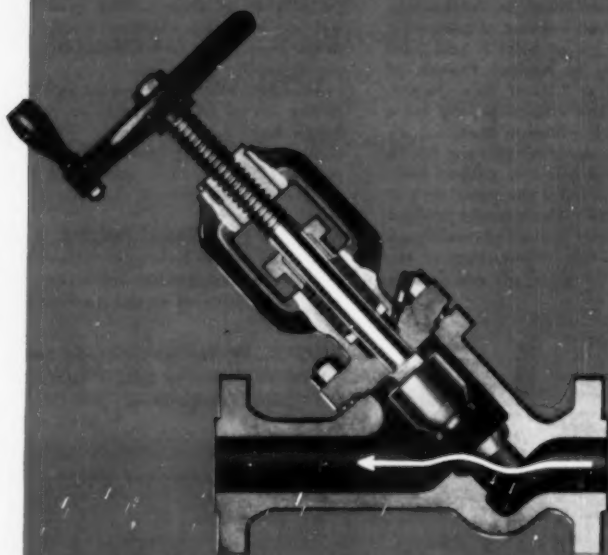
Features balanced nitralloy hollow plunger that seals line drop-tight, yet permits free, unobstructed flow in blow-down. Other features — laminated packing, ale-mite lubrication, ball thrust bearings. USED SUCCESSFULLY IN OVER 15,000 BOILER PLANTS.



**FOR  
LOW and  
MEDIUM  
PRESSURES**

## **YARWAY HARD-SEAT**

Features tough, stellite-faced and ground disc and seat ring, mated to provide smooth long-wearing surfaces. Stream-line flow. Alemite lubrication. MORE THAN 4 OUT OF 5 HIGH PRESSURE BOILER PLANTS USE YARWAY BLOW-OFF VALVES.



**FOR  
HIGHER  
PRESSURES**

**USED IN OVER 15,000 BOILER PLANTS**



# serve every boiler blow-down need

■ Whatever your *pressure* requirement, whatever your *piping* requirement—there's a Yarway Blow-Off Valve to exactly meet your needs.

Popular Yarway *seatless* design keeps blow-down lines drop-tight in low and medium pressure ranges. Sturdy Yarway *stellite seat and disc* design protects higher pressures.

All Yarway Blow-Off Valves are strong, rugged valves, built to withstand the punishment of regular or emergency blowing-down under full boiler pressure, and are available in metals that stand up under acid washing of boilers.

Write for new Yarway Blow-Off Valve Bulletins—B-426 (pressures to 400 psi) or B-434 (pressures to 2500 psi).



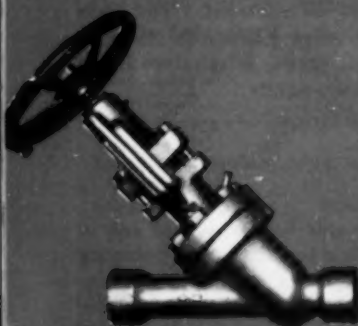
• Yarway Type B Seatless Blow-Off Valve, iron body for boiler pressures to 200 psi, steel bodies, for pressures to 400 psi. Angle valve shown, straightway available. Flanged connections. See Bulletin B-426.



• Yarway Type B Seatless Tandem Blow-Off Valve combining two angle valves. Other combinations available. Iron bodies for boiler pressures to 200 psi, steel bodies for pressures to 400 psi. See Bulletin B-426.



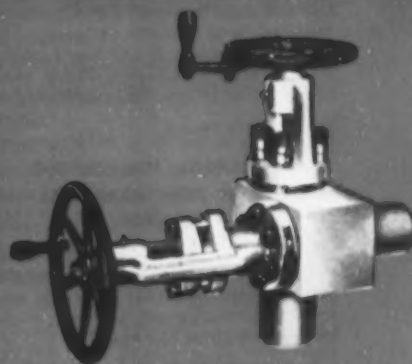
• Yarway Type C Seatless Tandem Blow-Off Valve combining angle and straightway valves. Other combinations available. Flanged or welding connections available. For boiler pressures to 600 psi. NOTE: When used in tandem with a Yarway Hard-Seat Valve, Type C Seatless may be used to 1500 psi. See Bulletin B-434.



• Yarway Hard-Seat Blow-Off Valve, for pressures to 2500 psi. Straightway valve shown. Angle available. Welded (shown) or flanged connections. See Bulletin B-434.



• Yarway Hard-Seat—Seatless Bellied Tandem Blow-Off Valve. Hard-Seat is the blowing valve, seatless is the sealing valve. Available in any combination of connections. For pressures to 1800 psi. Hard seat-hard seat tandems for pressures to 2500 psi. See Bulletin B-434.



• Yarway Unit Tandem Blow-Off Valve. Combines a hard-seat blowing valve and a seatless sealing valve in one-piece forged steel body for boiler pressures to 1500 psi. For pressures to 2500 psi, two hard-seat valves are combined. See Bulletin B-434.

LET YARWAY HELP SOLVE YOUR  
BOILER BLOW-DOWN PROBLEMS!

**YARNALL-WARING COMPANY**

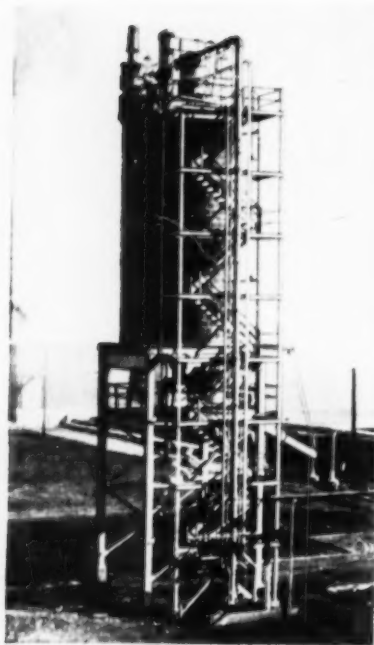
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## blow-off valves



A National Installation at the CHEMSTRAND CORPORATION in Decatur, Alabama

## turn the **EXPERIENCE OF OTHERS** to your advantage

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### **Case 32—Louisiana Refinery**

## **Reactivator Clarifies Turbid River Water**

A LARGE Louisiana refinery had to use Mississippi River water but found that the turbidity was extremely high. At times it went to 10,000-15,000 ppm or 25% solids by volume. It was so turbid that the strainers on the pump suction were continually becoming loaded with mud.

A Graver Reactivator was installed to handle a flow of up to 3000 gpm. The Reactivator, a cold process clarifier and softener manufactured by Graver Water Conditioning Co., is 47 ft in diameter and is followed by pressure filters and zeolite softeners for further water treatment.

In the Reactivator, the water and chemicals enter in the center up-

take section and are circulated by means of an impeller with previously formed precipitates. Part of the water then enters the settling chamber and rises toward the effluent collector while the remaining water recirculates, with new raw water being introduced.

Sludge is collected in the bottom of the unit by a continually rotating sludge scraper and moved to a central sludge pit from which it is automatically blown off.

Special consideration had to be taken into account on this job because of the excessive amount of sludge to be removed. The unit has been solving this difficult problem of clarifying Mississippi River water successfully.

### **Case 33—North Carolina**

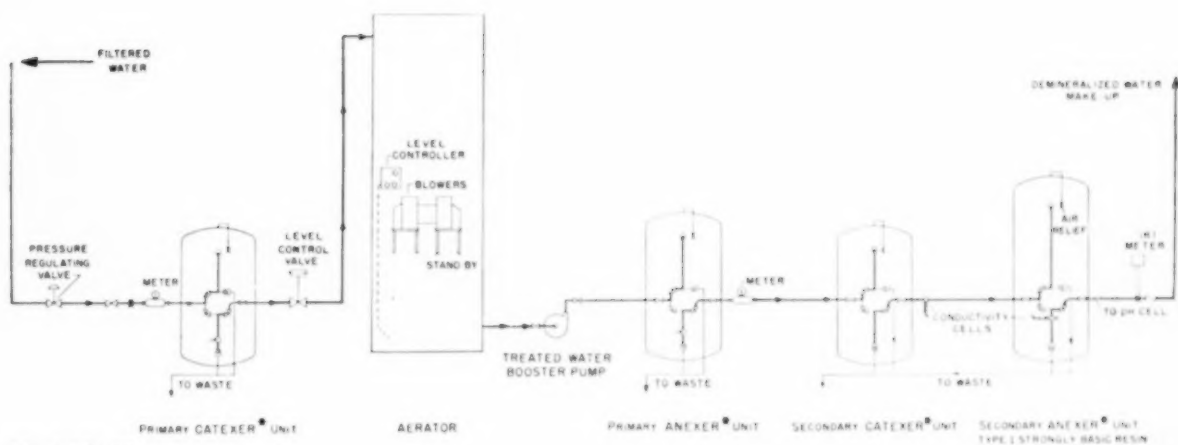
## **Gold Mine Pays Off**

THE General Electric Company's Automatic Blanket plant at Asheboro, North Carolina, has a real gold mine on its property. This ninety foot shaft with its tunnel network, actually produced some quantity of the yellow ore in days gone past. Today, however, in place of the vein of gold beneath the ground surface there exists a subterranean reservoir of water.

The plant's annual water requirement is slightly over one hundred million gallons. By recircu-

lating water for industrial use in six cooling towers, while pumping an average of twenty-five thousand gallons per work day from the gold mine, the cost per thousand gallons of water is kept to an average of \$.035. To supply the total requirement from municipal source would mean an annual cost of \$40,000. Actual cost of \$4,000 covers the purchase of municipal water for drinking and all expenses concurrent with recirculating and pumping operations. This results in an annual savings of \$36,000. The gold mine still pays off!

By H. W. WALLACE, Manufacturing Engineer, General Electric Company, Small Appliance Div., Asheboro, N. C.



THIS Inflico equipment arrangement and process eliminated control problems. Cost of chemicals for regeneration is about one half that required by a conventional two bed demineralizer.

### Case 34—Southwestern Utility

## More and Better Water at Lower Cost

A TEXAS utility was making plans for a new high pressure boiler and turbine installation. Providing boiler feedwater makeup of satisfactory quality posed a serious problem because of the relatively poor quality and variable characteristics of the available water supply. Note the following analysis:

Total hardness (as $\text{CaCO}_3$ )	135 to 175 ppm
Methyl Orange alkalinity (as $\text{CaCO}_3$ )	111 to 150 ppm
Sulphates & chlorides (as $\text{CaCO}_3$ )	131 to 325 ppm
Silica (as $\text{SiO}_2$ )	18 to 25 ppm

Previous experience with evaporated makeup had not proven entirely satisfactory and consequently a study was made of the possibility of using ion exchange treatment for practically complete removal of dissolved solids and silica from the makeup water.

While there was no question regarding the ability of this process to provide water of the required quality, in view of its many satisfactory applications elsewhere, the variable nature of the water to be treated presented a serious problem in connection with control of operation of equipment of this type.

This was the case because final

water quality was exacting, i.e. treated water to contain not over 0.1 ppm of silica, not over 0.1 ppm of hardness and not over 4 ppm total dissolved solids. Obviously to produce treated water of such low solids content, very exacting and close control of ion exchanger operation would be required with the conventional two bed (cation and anion) system inasmuch as any "leakage" of unwanted ions as the result of exchanger overrun, or faulty regeneration, would make the specified result unobtainable.

The source of water supply is an impoundment of a river water supplemented in dry seasons by a rather highly mineralized well water. In consequence, dissolved solids content of the water is more or less continuously variable. Since ion exchange units have a definite exchange capacity per regeneration it follows that as dissolved solids in the water increase, the capacity of the exchanger units in gallons per regeneration will decrease in direct proportion; and, vice versa, as dissolved solids decrease, the gallon capacity of the exchanger units per regeneration increases. Hence, volumetric metering of water throughout was inapplicable as a means for signalling unit ex-


haustion. For regenerant chemical economy attainment of the full exchange capacity each run is necessary.

This could be accomplished in this case with the conventional two bed (cation and anion) plant only by making a virtually complete analysis of the raw water daily at least, and possibly oftener, during periods of rapid raw water changes—a costly and time consuming procedure. Moreover with such a set-up, manual initiation of regeneration operations would be required with consequent additional labor charge.

Faced with this combination of circumstances, the problem was solved by installing a fully automatic Inflico 4 bed demineralizing plant comprising a primary cation exchanger, a degasifier, a primary weak base (acid absorbing) anion exchanger, a secondary cation exchanger and finally a strong base (silica absorbing) anion exchanger through which the water is passed in series in the order listed.

Not only did this equipment arrangement now in operation for several months eliminate the problems of control on the water of variable characteristics and insure continuous production of specified water quality but, in addition, by the regenerating technique evolved by Inflico engineers the cost of chemicals for regeneration is about one-half that required by a conventional two bed demineralizer.

# Isolated Circuits Do the Trick!



**Give you prompt, positive . . .**

- ▶ fuel cut-out
- ▶ low water alarm
- ▶ high water alarm
- ▶ pump start
- ▶ pump stop

(or selection of these facilities)

Levalarm EA15 supplies quick fuel cut-out on the two 200 psi boilers at Toledo University.

## Reliance Electrode-Type Levalarms for pressures up to 1100 psi.

You can operate alarms and fuel cut-out, start and stop pumps by means of these latest Reliance devices. Installed on or in the water column, the four models of the new Levalarms provide a desirable selection for various control combinations on boiler pressure from the lowest to 1100 psi. They're ideal for use on package boilers.

Operated by relays and special transformer-created currents, Levalarms are entirely electrical — have no bellows or stuffing boxes, vacuum tubes or magnets. They take their commands from the boiler water itself, as it rises or falls in the water column.

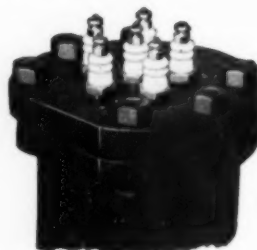
It's easier to understand these devices by reading the special catalog bulletin D2, completely illustrated. Please write for it.

**The Reliance Gauge Column Company**  
5902 Carnegie Avenue • Cleveland 3, Ohio

*The name that introduced safety water columns....in 1884*

# Reliance

## BOILER SAFETY DEVICES



How electrodes are installed in water column head (and protected by cover) for Levalarms EA17 and 18.



### Case 35—Virginia

## Heat Pumps for Industrial Plants

**S**EVENTEEN 5-ton General Electric Weathertron units (air-source heat pumps) are employed by the Virginia Shoe Company to electrically heat and cool its new plant in Fredericksburg, Virginia. This company is housed in a one-story insulated cinder block building in which production, assembly, and office areas total more than 25,000 sq ft. The company employs about 300 people.

In addition to the less tangible benefits of employee comfort and morale, company officials reported a good business reason for air conditioning—maintaining a constant temperature and an even level of relative humidity is especially important in shoe manufacture. Hides used in shoes are easier to work in a controlled atmosphere and a product of more consistent quality is possible.

### Requirements Vary

Individual zone control was necessary throughout the plant. Twenty-nine kw of resistance heaters are used for gluing and drying operations and some 132 fractional horsepower motors are used on the company's machines. To meet the widely varying heating and cooling requirements imposed by this equipment, each heat pump has its own thermostatic controls to automatically adjust its performance to the actual needs of the area it serves.

### Air-Source Pumps

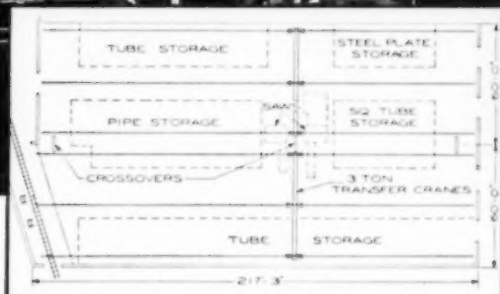
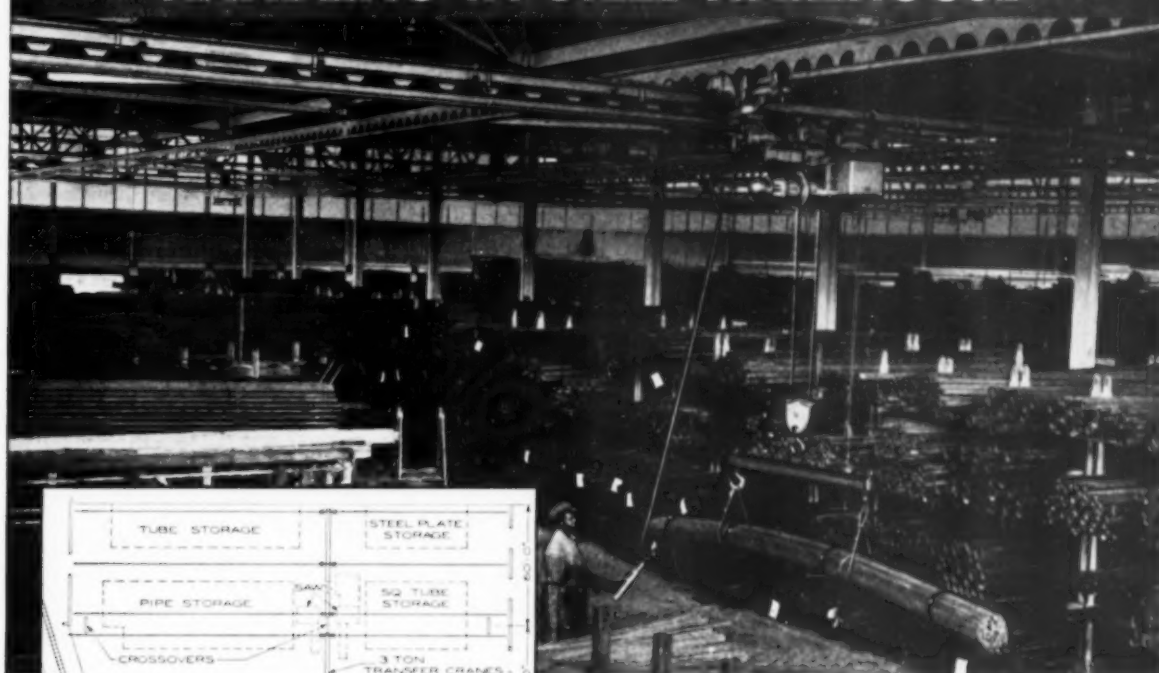
The air conditioning was designed on the basis of 95° dry bulb, 78° wet bulb, which is standard for the Fredericksburg area. The seventeen Weathertrons have a total installed cooling capacity of 85 tons of refrigeration.

All units are located in space around the outside walls with five inches between the units and walls. Short stub ducts supply each individual unit with outdoor air.

In winter, air-source heat pumps extract heat from this outdoor air,



# TRAMRAIL TRANSFER CRANES SYSTEMATIZE HANDLING IN STEEL WAREHOUSE



The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

▲ The Tramrail transfer cranes make it easy to place the long unwieldy pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

**T**HE BIG modern warehouse of J. M. Tull Metal & Supply Co., Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active

plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aiseways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.

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THE CLEVELAND CRANE & ENGINEERING CO.  
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**SubALOX** is based on a heavy colloidal lead pigment which gives excellent rust protection and limits spattering when applied to wire mesh.

**SubALOX** is available in a variety of colors—the most popular being the metallics used to simulate the appearance of galvanizing. Old fences can be given a "new look" which can be easily maintained with a minimum of time, labor and material cost.

Detailed instructions are contained in "SIMPLIFIED FENCE PAINTING"—yours for the asking.



**SubALOX Inc.**

6 Fairmount Plant, Hackensack, N. J.

pumping it into the building being heated. In summer they reverse themselves automatically, extracting heat from indoor air and pumping it outside. No water is used in these operations.

The local utility estimated the annual cost for heating and cooling the Virginia Shoe Company to be about \$2500, a 30% advantage over a conventional fuel-fired system. This advantage is due in part to the all-electric nature of the factory. The boost given its power load by the use of heat pumps assures it receiving the most favorable power rates.

### Case 36—Textile Mill

#### Air Contaminants

**C**ONDENSATION of water vapors in the compressed air distribution system of a Southern textile mill resulted in the loss of control over humidity and temperature. Pneumatic instruments and controllers would not hold correct conditions. Threads broke, creating work stoppages. The instruments and controls had to be cleaned on a daily basis. When work stoppages occurred, additional cleaning of the affected controller was necessary.

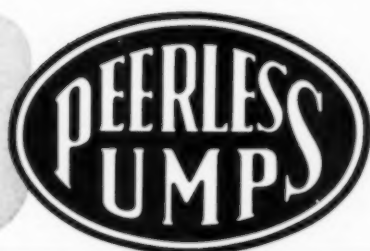
#### Corrective Measure

Hankinson Corporation engineers recommended the installation of the correct model and number of units of the Condensifilter to eliminate the contaminants in the compressed air supply. Condensifilters lower the dew point of compressed air to within one or two degrees of the available cooling water temperature, eliminating water and oil vapors, and removing solid particles by filtration.

Daily maintenance of instruments and controls is no longer necessary. Water, or oil, has not appeared in any pneumatic instrument or control since installing Condensifilters. The only maintenance of instruments required is that caused by failure of a component part, but no failure can be traced to water, dirt, or oil in the air system.

5

# Peerless Pump Designs



*that squarely meet every*  
**WATER HANDLING REQUIREMENT**

THESE ARE THE *Pumps*

ASK FOR **FREE**  
ENGINEERING BULLETINS

## TYPE A AND TYPE AS GENERAL PURPOSE PUMPS

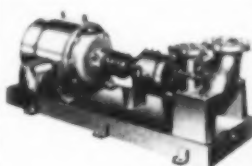
Use these pumps in the widest range of water handling services. Single stage, horizontal split case design. Mechanical shaft seal construction available in sizes up to 4" (Type AS). Heads: up to 300 ft.; capacities up to 70,000 gpm.



Ask for  
BULLETIN  
B-1300  
& B-1350

## TYPE PR AND TYPE PRS HIGH TEMPERATURE, HIGH PRESSURE PUMPS

Horizontal center-line-mount pumps with packing gland or mechanical shaft seal construction. End or top suction designs. Heavy duty pumps for heads up to 675 ft. Capacities: up to 1000 gpm and temperatures up to 850°F.



Ask for  
BULLETIN  
B-1605

## TYPE PE AND TYPE PB END-SUCTION PUMPS

America's broadest line of economical, general purpose pumps. Horsepower range from 1/4 to 150. Head range to 260 ft. Capacities up to 5500 gpm. Easy to buy, apply, install and maintain. Tens of thousands in use.



Ask for  
BULLETIN  
B-2300

## TYPE TU AND TYPE TUT MULTI-STAGE PUMPS

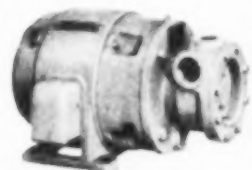
2,3,4 and 5-stage designs for supplying, circulating and boosting water and other liquids in moderate capacities against medium and high heads. Durable and dependable in operation. Heads up to 1660 feet; capacities up to 3000 gpm.



Ask for  
BULLETIN  
B-1400

## TYPE TVE AND TYPE TVB TURBINE VANE PUMPS

For pumping hot and cold, clear and vaporous liquids in small capacities against high heads. Widely used throughout industry for water boosting, circulating, transferring. Easy to install and maintain. Capacities: up to 58 gpm; heads up to 800 feet.



Ask for  
BULLETIN  
B-2205

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FOOD MACHINERY AND CHEMICAL CORPORATION

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Offices: New York; Atlanta; Chicago; St. Louis;  
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Please send Bulletins checked below

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Bulletin B-1300

☐ Type AS  
Bulletin B-1350

☐ Type PR-PRS  
Bulletin B-1605

☐ Type PE-PB  
Bulletin B-2300

☐ Type TU  
Bulletin B-1400

☐ Type TVE and TVB  
Bulletin B-2205

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Case 37—Texas

## More Refrigeration from Same Compressors

**P**RODUCTION at Sanitary Farm Dairies milk plant in Houston had reached the point where additional refrigeration was required.

The instantaneous refrigeration load amounted to 173 tons while the refrigeration capacity was only 95 tons. To add the additional capacity in compressors and condensers meant a space problem. It would be necessary to replace the existing slow speed compressors with newer high speed compressors which have greater capacity for less floor space.

Adding new compressors and condensers would involve an expensive initial investment, and operating cost would also be expensive. Operation in this, as in other milk plants, is such that the entire refrigeration load exists only a few hours per day. Therefore, even though peak capacity was inadequate, the existing compressors were idle several hours per day.

The cooling of milk is normally done by using chilled water. It was recommended that the existing refrigeration capacity be used to make ice at night while this equipment had in the past been shut down. Then, during the day the ice could be melted to produce chilled water required to cool the milk.

If additional compressors, motors and condensers had been installed to produce the required refrigeration capacity the initial cost would have been approximately \$30,000.

An ice-building sweet water tank was actually installed for about one third the cost of additional high-side equipment.

The ice-building sweet water tank was designed to cool a minimum of 180,000 lb of milk through 20 degrees F in four hours. This represents a refrigeration load of 864,000 Btu per hour or 72.0 tons. This is the equivalent of melting 6000 lb of ice per hour. Since this



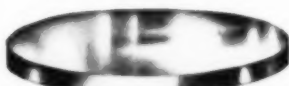
SARCO  
**Thermodynamic**  
STEAM TRAP



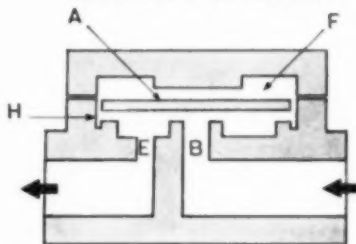
ACTUAL SIZE

# this new trap virtually eliminates maintenance

**SOLID STAINLESS STEEL DISC  
ACTS AS VALVE HEAD**



**HERE'S HOW IT WORKS!**



Air and/or condensate raise valve seat disc A, discharge thru E. When steam follows, greater velocity causes it to strike body at H thus building up pressure in chamber F. This causes disc to seat, closing tube B. As pressure in F decreases by condensation, pressure in tube B raises disc and cycle is repeated.

The Sarco Thermodynamic Trap has proved successful on steam mains and separators; headers and soot blower pipes; engine and turbine stop valves, separators and casing drains; alternate heating and cooling applications.

209B-B

*A solid stainless steel disc — practically indestructible — is the only moving part!*

**M**OST striking feature of the Sarco Thermodynamic Trap is its simple maintenance-free design. There's only one moving part — a solid stainless steel disc that practically lasts forever. There are no other moving parts to wear out or cause trouble.

Condensate, air and steam act directly on the disc valve which opens to discharge condensate and air — snaps shut to contain steam. There are no mechanical devices required to operate valve (see diagram at left). That means practically endless trouble-free operation.

Other advantages: small size, easy installation, not affected by shock or vibration, immunity to corrosive elements with all wearing parts stainless steel, same valve head and seat for all pressures to 600 psi and temperatures to 950° F.

Check these advantages to your own satisfaction at absolutely no cost. We'll send you a trap for trial. All you do is fill out the coupon and mail it in.

**SARCO COMPANY, Inc.**

Empire State Building, New York 1, N. Y.

**MAIL COUPON  
TODAY FOR  
TRIAL**

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.  
Gentlemen: Please send me a Sarco Thermodynamic Trap for a 60-day trial, requirements as checked.

Size: 1/2" ... 3/4" ... 1" ... Operating Pressure: ..... psi

For installation on: .....

NAME .....

FIRM .....

ADDRESS .....

CITY ..... STATE .....

## Fairbanks 5 Cost-Cutters For Your Light, Bulky Materials Handling Jobs

rugged construction and smoother operation take the load off your mind . . .



**9215-S General Purpose Truck**—more widely regarded as a necessary tool in shipping rooms, stores, warehouses, passenger baggage terminals and with transfer and express companies—for use on delivery trucks—where it is unsurpassed for handling small lot merchandise including round objects. Steel framed construction.



**A-1448 Utility Truck**—very popular in stores, offices, institutions, shipping rooms and factories for carrying small lot merchandise and widely used in bottling and beverage plants and on beverage delivery trucks for moving case lots. All steel welded construction, fitted with stair climber.



**Lift Jack Platform Trucks**—perfect answers for minimum cost temporary storage of raw material, parts, semi-finished goods or finished pieces. Jack handle has no moving parts—engages and disengages semi-live skid simply and quickly. One jack handle sufficient for a number of platforms.



**"Bantamweight" Platform Trucks**—outstanding values for lightweight materials handling from low initial cost through minimum operating expense. Readily adaptable to continuous conveyor systems. Light and strong construction, very mobile on Fairbanks "Lockweld" Double Ball Race Swivel Casters and matching rigid casters.



**T-1114 Dollies**—providing greatest maneuverability for bulky merchandise on Fairbanks "Lockweld" Steel Double Ball Race Swivel Casters. Very popular trucks with furniture movers, storage warehousemen and truckers.

**YOURS ON REQUEST:** Fairbanks Truck Catalog, complete with illustrations and specifications describing Fairbanks Trucks.

THE **Fairbanks** COMPANY  
393 LAFAYETTE STREET, NEW YORK 3, NEW YORK  
BRANCHES: NEW YORK 3  
BOSTON 10, PITTSBURGH 22, ROME, GEORGIA  
VALVES • TRUCKS • CASTERS • WHEELS • DART & "PIC" UNIONS



load occurs for four hours it was necessary to produce 24,000 lb of ice.

By arranging the 1 1/4" pipe coils on 7" centers it is possible to freeze ice to 6" diameter. On this basis each foot of coil will freeze 9 lb of ice. So, for 24,000 lb of ice we required 2600 ft of 1 1/4" coil.

The tank was sized 30 ft long, 10 ft wide and 4 ft high and located in an out of the way space in the basement. The coils are kept flooded with liquid ammonia through a surge drum located above the tank. The ammonia suction pressure required is 20 to 30 psig.

This is an economical means of increasing refrigeration capacity for short periods of time and has been used successfully not only in dairy and ice cream plants but also in church and auditorium air conditioning where large capacities are required for relatively short periods.

By R. S. SANDIFER, Sales Engineer, York Corporation, Houston, Texas

### Case 38—Tennessee

## Dual Purpose Compressor

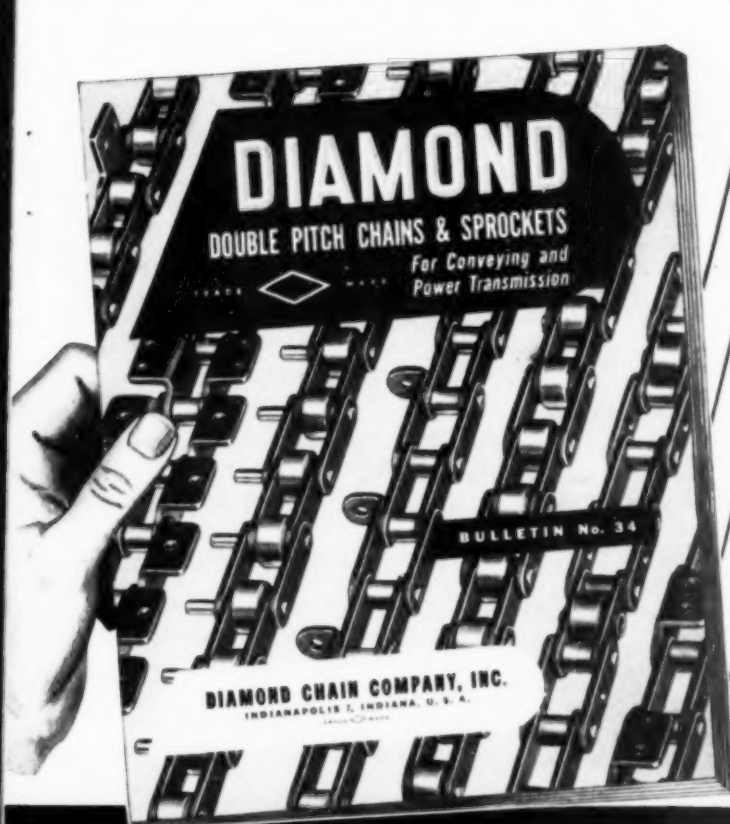
**A**T Kingsport, Tennessee, Tennessee Eastman manufactures industrial chemicals, acetate yarn and staple, and cellulose ester plastics.

One of the chemicals handled is propane. This is stored at Kingsport for stand-by purposes, in a field of tanks.

A Frick 3-cylinder 3 1/2 x 4 1/4 "Eclipse" AHP compressor is used for transferring propane from the railway cars to the storage tanks. The machine is driven by a direct-connected motor of the explosion-proof type, and is equipped with controls of the same kind.

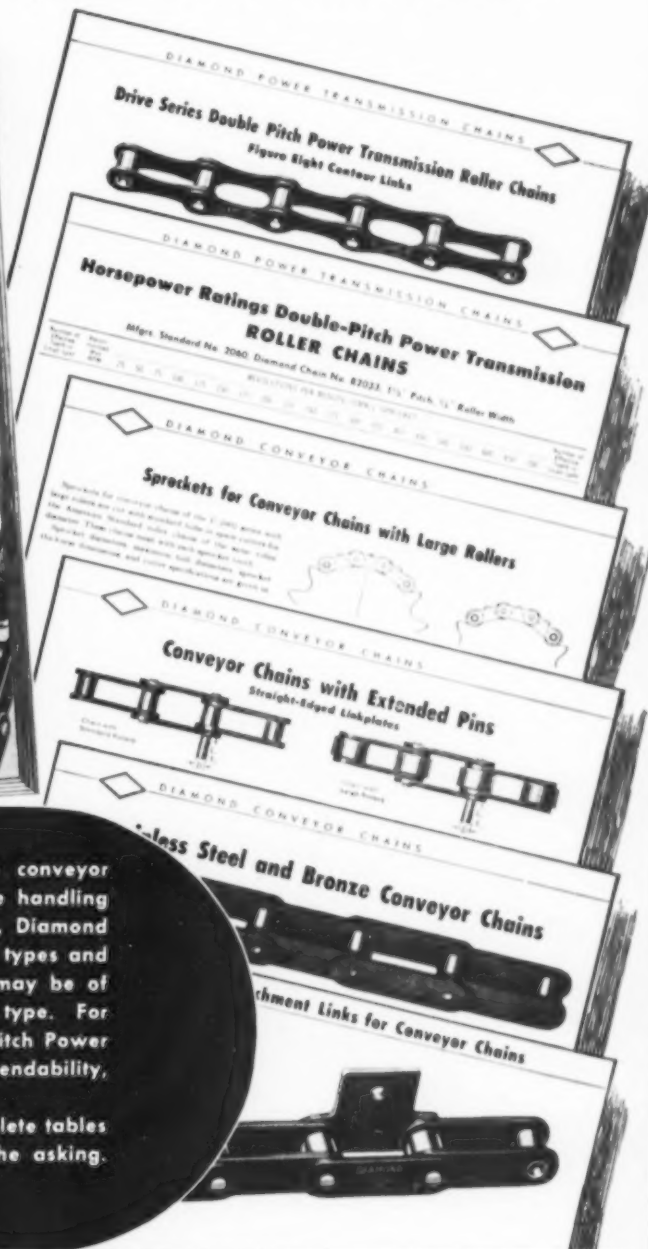
The Frick machine serves a dual purpose: it can be used to relieve the gas pressure in the top of the storage tank about to be filled, the gas collected being pumped into the top of the tank car; or it can be connected directly to the tank car for pumping out and saving the gas remaining when the liquid has been drained.

# NEW BULLETIN 34 Simplifies Selection of Conveyor Chains and Moderate Speed Power Drive Chains



Precision-made conveying media are important in modern conveyor systems, sorting, timing and feeding mechanisms and for the handling of materials, containers, parts in process. For such functions, Diamond Double-Pitch Conveyor Chains are made in a great variety of types and sizes. Attachments can be located at intervals desired and may be of the bent or straight type, extended pin, pusher or cradle type. For moderate speed transmission of power the Diamond Double-Pitch Power Transmission Chains provide light weight with complete dependability, and long life, attractively priced.

The 32 pages of New Bulletin 34 carry illustrations and complete tables for easy selection. Just off the press, a copy is yours for the asking. Tear out the coupon reminder now.



**DIAMOND CHAIN COMPANY, Inc.**  
Dept. 612, 402 Kentucky Ave., Indianapolis 7, Indiana

Offices and Distributors in all Principal Cities.  
Please refer to the classified section of your local telephone directory under the heading CHAINS OR CHAINS-ROLLER

## DIAMOND DOUBLE-PITCH CHAINS AND SPROCKETS

TRADE  MARK

### CLIP COUPON AND MAIL!

Diamond Chain Company, Inc.  
Dept. 612, 402 Kentucky Ave.  
Indianapolis 7, Ind.

Please mail a copy of your New Bulletin 34 to:

Name

Firm Name

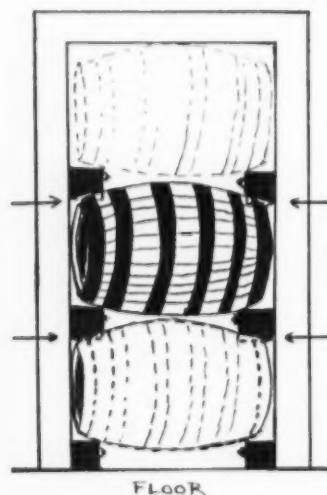
Address

City  Zone  State



## Section 5

# Maintenance Procedures



**PROBLEM:** ALTERING BARREL RACKS TO ACCOMMODATE LARGER SIZED BARRELS IN NATIONAL REVENUE BONDED WAREHOUSE, BALTIMORE, MD.

TWO 20° BEVEL RIP CUTS MADE ON EACH RACK (18' LONG BULL PINE 4'x4's)

EACH CUT APPROX. 2 1/8" DEEP.

**SOLUTION:** SIX MAN TEAM USING BLACK+DECKER 6" HEAVY-DUTY ADJUSTABLE SAWS. RACKS UNBOLTED FOR CUTTING.

### Case 39—Maryland Warehouse

### Bevel Rips 2000 4" x 4" Bull Pine Racks

**I**N Baltimore, Maryland, Hoffman & Bishop, builders and engineers, were given the tough job of altering 2,000 barrel racks in a National Revenue Bonded Warehouse to hold larger barrels. To make the required room between racks, the under side of each rack

had to be bevel rip cut twice at a 20° angle, approximately 2 1/8" deep.

The 18 ft long 4" x 4" Bull Pine racks turned out to be the toughest wood the contractors had ever tried to cut.

Three possible solutions to the

problem were considered. The first was to make the cuts with the racks still fastened to the upright posts. This was ruled out as being too time consuming.

The second was to unbolt the racks and send them to a mill for cutting. Since the warehouse had no windows, getting the racks out the two small doors on each floor and transporting them to the mill would have been too involved. Laid end to end, the racks would reach almost seven miles and getting them out of the warehouse was definitely impractical.

The third and accepted solution was to unbolt the racks, assemble them on each floor, make the rip cuts with portable electric saws and then bolt the racks back in place.

The saws started to work on the 18 ft long 4 x 4's—or vice versa, according to Jesse Schissler, superintendent for Hoffman and Bishop.

"Those 4 x 4's were the toughest pieces we've come across," said Mr. Schissler. "We had a deadline to make and were losing man hours from the start, with four different saws that kept burning out."

The work called for a six man crew, using three portable elec-



# OBEDY THE LAW

## and pocket the difference

TAYLOR STOKERS are operating today in the heart of some of the finest urban areas...meeting ironclad stack discharge ordinances without expensive fly ash collectors and resultant draft losses...yet burning whatever types of coal cost least in each particular locality.

### **MATCHLESS EFFICIENCY**

Smokeless operation and outstanding economy...higher average CO<sub>2</sub>, minimum solids in stack gases...these are outstanding characteristics of engineered Taylor Stokers.

### **UP TO 500,000 LBS.**

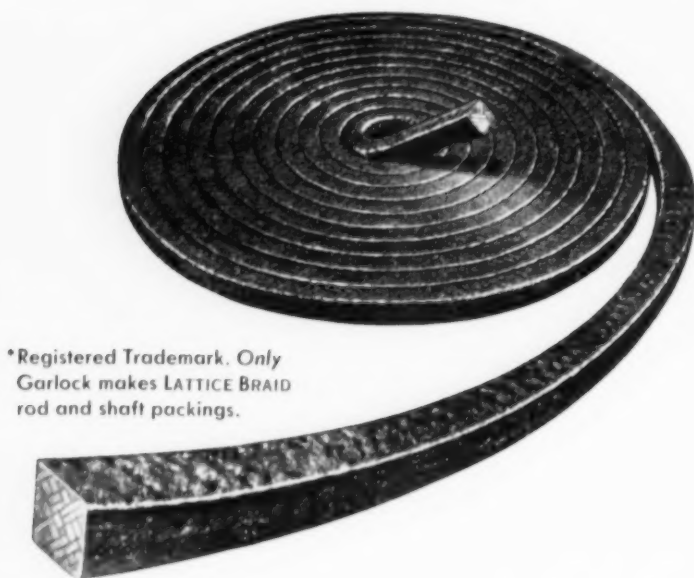
Whether you require 20,000 or 500,000 lbs. of steam per hour, ask your Consulting Engineer about Taylor, the completely modern stoker with the old, old name...write for descriptive literature. American Engineering Company, 2421 Aramingo Ave., Philadelphia 25, Pa.



# LATTICE BRAID\* Packing

remains soft and flexible—

## gives 3 years service on ammonia valves at Terre Haute Brewery



\*Registered Trademark. Only Garlock makes LATTICE BRAID rod and shaft packings.

"LATTICE BRAID is the best all-purpose packing we've ever used," reports Irving Hayworth, Chief Engineer at Terre Haute Brewery. "LATTICE BRAID gives us 3 years service on valves handling ammonia. This compares with 6 months service which we would usually receive from other packings. In addition, our men now use LATTICE BRAID packing on every cold water pump in the brewery."

Put Garlock LATTICE BRAID Packing to work for your company. All the braided strands of this unique packing are lattice linked together into one structural unit. The strands hold together even when the packing is worn far beyond the limits of wear of ordinary braided packings.

LATTICE BRAID is made from flax, cotton, asbestos, wire-inserted asbestos, Teflon, and asbestos with Teflon impregnation—for various types of services.

*Get all the facts about LATTICE BRAID Packings. Contact your Garlock representative or write for new folder AD-131.*

### THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

Sales Offices and Warehouses: Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit • Houston • Los Angeles • New Orleans • New York City • Palmyra (N.Y.) • Philadelphia • Pittsburgh • Portland (Oregon) • Salt Lake City • San Francisco • St. Louis • Seattle • Spokane • Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

# GARLOCK

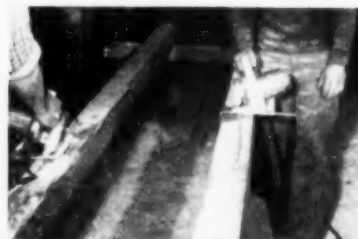
## LATTICE BRAID PACKING

tric saws, to do the job. However, "down time" on the saws made meeting the completion deadline a problem. Hoffman & Bishop had allowed two days to complete each of the six floors. The first floor rack alterations took four days, and at that rate they never would have made their deadline for completing the job. The 6", 8" and 12" saws they were using just couldn't handle the Bull Pine. The tough wood was causing them to burn out rapidly.

Then Hoffman & Bishop decided to try out two new Black & Decker 6" heavy-duty Adjustable Saws. The 18 ft racks were placed parallel on saw horses in pairs on each floor. Two men worked from opposite ends of the parallel racks, using the Black & Decker 6" Heavy-Duty Adjustable Saws with Rip Fences attached. The saws were put to work making the necessary bevel rip cuts.

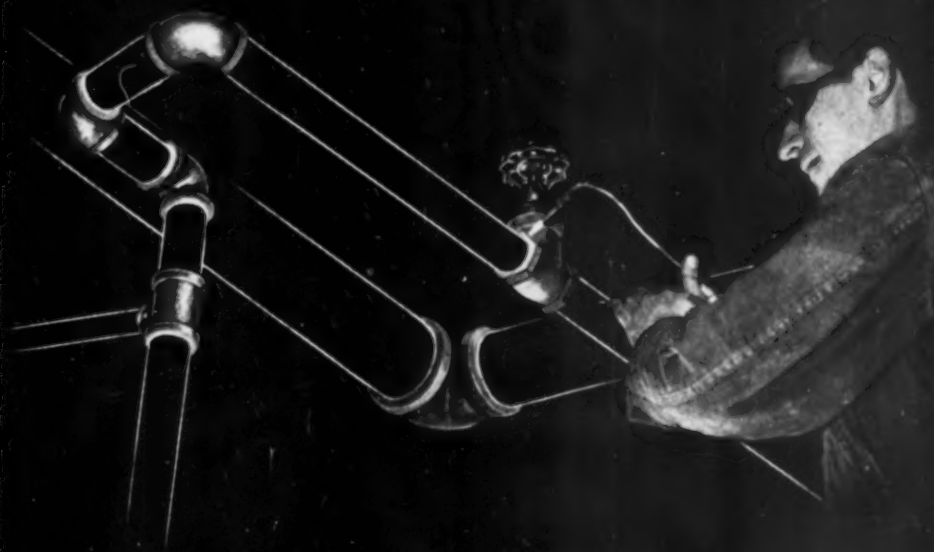
"Those two new B&D 6" Saws

WORKMEN bevel ripping these 4" x 4" Bull Pine barrel racks cut them in pairs, working from opposite ends. Two cuts at 20° and 2 1/8" deep had to be made on each rack.



Jesse Schissler, job superintendent, points to the bevel rip cuts made on each of the 2,000 racks, which were unbolted to make the cuts. Job was finished in 16 days, using Black & Decker portable electric saws, which saved carting racks to the mill.

# WALWORTH



## **WALSEAL<sup>®</sup> VALVES AND FITTINGS**

*Better because . . .* There's no guesswork when a silver-brazed joint is made with a Walseal fitting. Sil-Fos alloy, which appears as a fillet at the face of a Walseal joint, comes from rings which have been factory-inserted in the end connections of Walseal fittings. The bright silver alloy fillet that you can see assures full penetration of alloy for a permanently leakproof joint.

Walseal is a registered trade mark which identifies valves and fittings manufactured by the Walworth Company. Walseal products have factory-inserted rings of silver brazing alloy in threadless ports. Walseal joints can be made only with Walseal valves and fittings.

If you're piping water, oil, steam, air, oxygen, nitrogen, helium or other industrial gases or refrigerants through brass, copper, or copper-nickel pipe, you'll want to investigate Walseal — available in complete lines of valves and fittings in four distinct pressure ranges — from 0 to 5000 psi. working pressure\*. Your copy of Circular 115 will be sent on request . . . see your near-by Walworth Distributor today, or write to: Walworth Company, General Offices, 60 East 42nd Street, New York 17, N. Y.

\*Walseal fittings and valves are being used at sub-zero temperatures as low as -350 F.



Cutaway view of a Walseal Tee showing: factory-inserted ring of silver brazing alloy; fillet of silver brazing alloy that appears upon completion of Walseal joint; cutaway view of the completed joint showing that silver brazing alloy has flowed in both directions from the factory-inserted ring.

Make it "a one-piece pipeline" with WALSEAL



# WALWORTH

*Manufacturers since 1842*

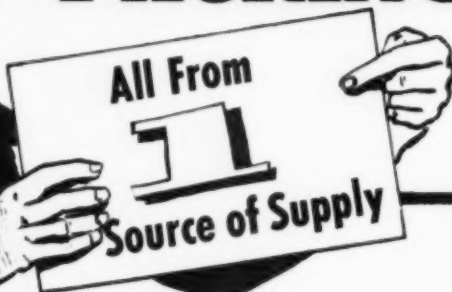
**valves . . . pipe fittings . . . pipe wrenches**

60 East 42nd Street, New York 17, N. Y.

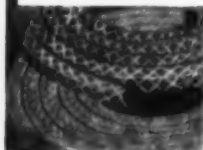
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



# BELMONT PACKINGS



Service conditions are constantly becoming more extreme. The success or failure of a piece of industrial equipment is many times dependent upon whether or not it can be properly sealed against loss of pressure, liquids or gases. Belmont for over sixty years has kept pace with the ever changing demands, offering a wide scope of packing materials to satisfactorily meet the toughest services. You can get them ALL from ONE SOURCE of SUPPLY. Get in touch with your nearest stocking Belmont distributor or mail us your specifications. Write for new condensed catalog #54.



## BELMONT "TEFLON"

For corrosive liquids—furnished in sheets, gaskets, rings, tape, plastic, molded bars and sleeves, extruded rods, spiral shapes, blue asbestos and white asbestos suspensoid.



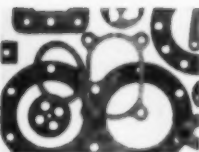
## BELMONT "O" RINGS

Made to close tolerance from synthetic and natural rubber, "Teflon", Silicone, for dynamic and static seal applications working against air, oil, steam, water, acids.



## BELMONT ROD PACKINGS

Like the one illustrated (Belmont 30), our many constructions have special features dependent upon services — asbestos, rubber and duck, plastic, metals, flax, jute, cotton, ramie.



## BELMONT GASKETS

Woven asbestos boiler manhole and handhole; rubber and synthetic molded, extruded, die or lathe cut; compressed asbestos, vegetable fibre.



## BELMONT LEATHER PACKINGS

Cup, flange, U and V shaped and washers in special tannages and treatments as service warrants.

**"THERE'S A BELMONT PACKING FOR EVERY SERVICE"...**

and the Belmont Distributor in your locality is ready to serve you. Write for his name and address.



**THE BELMONT PACKING & RUBBER CO.**

BUTLER AND SEPVIVA STREETS, PHILADELPHIA 37, PENNSYLVANIA

upped production at least 50%," said superintendent Schissler. "They are the coolest running saws we've seen, and the two together cost less than one larger saw that was constantly being overhauled."

The job was completed in time for inspection and the larger whisky barrels were moved in on schedule, thanks to the cool operation of the new Black & Decker Saws.

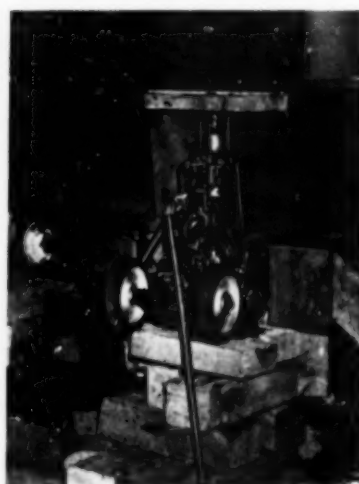
## Case 40—Oklahoma

### Air Motor Jacks

A SOUTHWESTERN firm slashed labor costs from an estimated \$2,200 to \$180 by using air motor jacks in place of mechanical jacks to lift a 240,000 lb turbine generator 22 ft for installation.

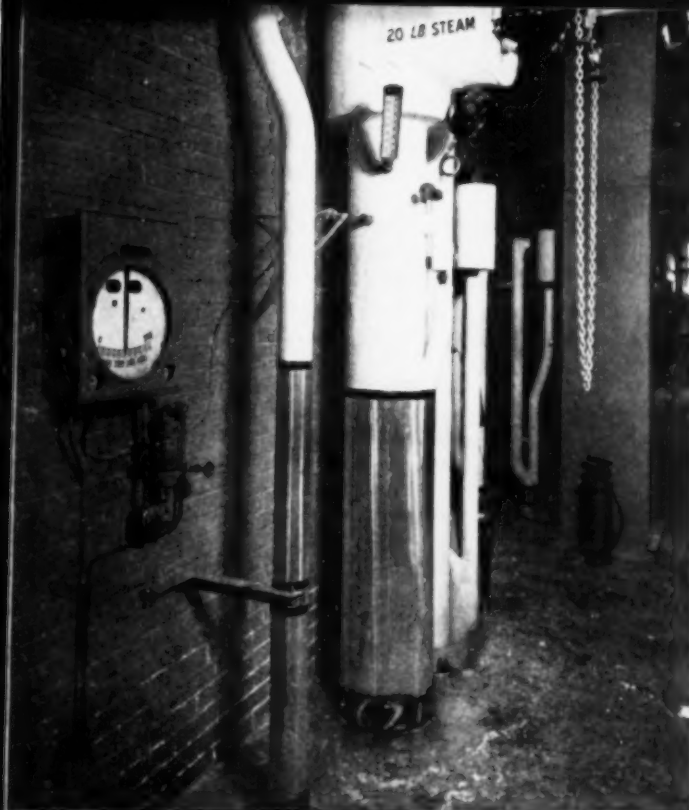
Two of the 100-ton capacity jacks, made by Duff-Norton Manufacturing Company of Pittsburgh, Pa., hoisted the generator for Western Farmers Electric Cooperative at Anadarko, Oklahoma.

With the Air Motor Jacks, three men completed the job in only two and one-half days. An official of the mechanical construction firm which installed the generator estimated that it would have taken eight men 12 days using mechanical



AIR MOTOR jacks instead of mechanical lifting devices saved \$2,000 in labor costs in this Oklahoma plant.





**PROBLEM:** High maintenance cost of canvas jacketing. High-pressure hot water hose used to clean floor damaged lower ends of lines and necessitated constant replacement.

**SOLUTION:** Childers Aluminum Jacketing replaced canvas. Waterproof—easy to install—reusable.

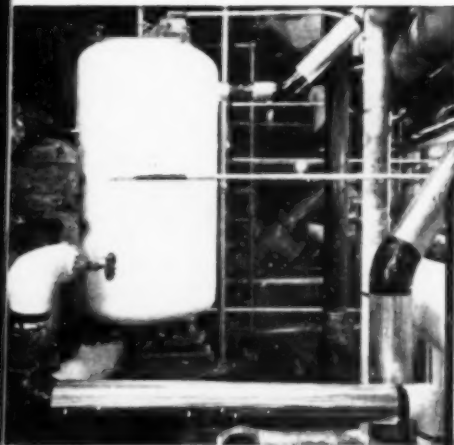


**PROBLEM:** Extreme hazard of fire from static electricity generated in machinery. Canvas jacketing could burn easily causing danger to men and machinery in plant.

**SOLUTION:** Childers Aluminum Jacketing installed. Fireproof—easily cleaned of oil to reduce fire hazard.

## Do Insulated Lines in Your Plant Cause These Three Common Problems and Hazards?

Read How Special Aluminum Jacketing Solved Them for Scott Paper Company



**PROBLEM:** Costly replacement of insulated lines damaged by oil drippage and bumping by men and tools.

**SOLUTION:** Maintenance engineers replaced canvas jacketing with Childers Aluminum Jacketing. Easy to wipe clean . . . durable and resistant to abrasion and abuse. Maintenance cost reduced.

The Scott Paper Company, Chester, Pa., and nearly 1,000 other modern plants in this country have protected insulated lines with Childers Aluminum Jacketing.

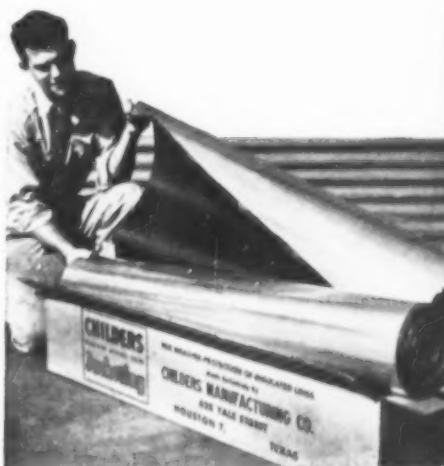
**Childers Aluminum Jacketing** cuts maintenance costs. It needs no upkeep . . . retains its protective value for years. Because Childers Aluminum Jacketing needs no painting, it can actually pay for itself in this saving alone. And of course, this modern aluminum jacketing can be removed and replaced easily for line repairs.

**Easy installation** cuts cost even farther. Only tools needed are pliers and wedge. Economical strapping holds jacketing securely—allows easy removal.

**Try this low-cost protection** in your plant. Write today for engineering data and information about how you can order a 400 sq. ft. roll to test on one of your insulated lines. No obligation. For full details write to: Childers Manufacturing Company, Department IP-1, 3620 West 11th Street, Houston 8, Texas.

### SPECIFICATIONS

**Childers Light-Weight Aluminum Jacketing**  
Shipped in rolls, 4 ft. wide; 100 ft. long with or without moisture barrier. Aluminum of .006" thickness. Cut with straight edge and dull knife. Write now for full details and engineering data.



**LOW COST** Childers Aluminum Jacketing answers many problems in plants all over the country. It's light weight, easy to install—goes on with simple bands. Weather, water, heat and fire resistant—can be used and re-used for years.

(Advertisement)

# MANZEL

## FORCE FEED LUBRICATORS

### COST LESS...

*than doing without them!*



***Pressure Application — Exact Amounts — Accurately Timed***

\* Manzel Force Feed Lubricators quickly save their cost by preventing breakdowns due to faulty or forgotten lubrication — by reducing the quantity of lubricants used — and by eliminating the labor of hand oiling. They keep vital parts properly lubricated for uninterrupted production efficiency round the clock.

You can have Manzel Force Feed Lubricators installed on present equipment or engineered into new machinery. Write for information.



**DIVISION OF FRONTIER INDUSTRIES, Inc.**

318 BABCOCK STREET, BUFFALO 10, NEW YORK

cal jacks. Fitters' wages at the time were about \$3 an hour.

The particular Duff-Norton Air Motor Jack used at Western Farmers had a raise of 14" and a head 6 1/8" in diameter. The portable jack can be wheeled about easily on its rubber-tired, roller bearing wheels.

The jack is operated from any system supplying 80 to 100 lb air pressure. Duff-Norton builds it in six models ranging in capacity from 20 to 100 tons. The jack ranges in weight from 238 to 530 lb, providing a sturdy base that prevents tipping or setting.

Aside from the substantial savings resulting from use of the jack, safety plays an important role. An automatic shut-off cuts out the motor when the lifting standard reaches the safe limit of its raised or lowered position.

The load not only is raised by air motor but is lowered the same way. Lowering speed always is under complete control. A keyway in the ram prevents the head from turning and shifting the load.

### **Case 41—Texas Chemical**

#### **Locating Leaks in Boiler Casings**

**D**URING the recent erection of two pressurized furnace boilers some difficulties were experienced in locating leaks in the settings.

The best system found for locating these leaks was to inject small quantities of freon gas into the air stream used to pressurize the setting and then monitor the surface of the boiler with an electronic halogen tester. These electronic testers are so sensitive that an operator may pick up a leak some distance from the actual hole or porous weld and "home" on the signal until he determines the actual location.

By M. A. LADT, Department Head, No. 2 Steam & Power Plant, Carbide and Carbon Chemicals Company, Texas City, Texas

## Electrical Testing and Record System

**D**EVELOPMENT of new electrical testing equipment and procedures for scheduling inspections and maintaining control over the work have been rapidly expanded over the past months by the mass distribution of the Multi-Amp tester and an efficient, economical visual record control system developed by Remington Rand Inc.

### Testing Unit

An industrial insurance company, specializing in boiler and machinery coverages, has equipped its field engineers with the units. Recently the company's supervising engineer issued a report terming the tester "of considerable value to us in our accident prevention work." He backed this statement by citing the report of results in a test inspection of equipment in a Louisiana salt mine by the company's New Orleans field engineer. The tests by the unit revealed these conditions—and led to immediate steps—in the mine:

1. Setting for the 300 hp motor driving the salt hoist was found to be too high. It was reduced to a safer setting.
2. A similar condition was found to exist on the 125 hp motor driving the main hoist. The condition was corrected.
3. The relay on the 75 hp motor for a large shovel was found to be defective, due to deterioration caused by salt in the mine. The relay was replaced.
4. The protective equipment for the 50 hp motor driving one of the undercutters was found defective, due to jamming of the trip lever. The condition was corrected.

**TWO CARDS** control the system—an Electrical Test record (top) and a Scheduling Control record. Cards are designed to serve as the work order for the mechanical phases (cleaning, oiling, minor repairs) and as review reports for the electrical engineer's or mechanical supervisor's authorizations for major repairs or replacements.

The supervising engineer's comment on these findings and results was this: "Without conducting the tests made possible by this new unit, we can only assume that protective equipment is in operating condition by checking the settings and by visual examination."

The new testing unit (Multi-Amp Corp.) is a "loading" device which supplies current from zero to 1,000 amp (more in newer, larger models) in stepless increments at comparatively low voltages. Portable, it is taken to the circuit breaker, starter, relay or other device or part to be checked and simply plugged into the nearest outlet. Because it supplies required amperages only to the safety device or part being checked, there is no risk of overloading motors, transformers, distribution lines or other parts of the electrical system.

### Control Record Forms

The newest and best testing devices and techniques are of limited value, however, if there is not a *planned* and *controlled* productive maintenance program. For that reason we called in Remington Rand systems specialists early in the development of our program and asked them to work up a group of simpli-



**MULTI-AMP** unit supplies required amperages only to the safety device or part being checked. There is no risk of overloading equipment.

fied record forms that would enable users of the testing units to maintain a control over the maintenance program.

The control system which was devised—and which is distributed with each unit—consists of sets of two 8" x 5" cards. The first of these is a pre-printed buff card for the Electrical Test record. Both sides of this card are for use in identifying the relays and circuit breakers (by stock number, location, make, serial number, rated voltage, hp, interrupted capacity, etc.), and for posting dates and the amperes ratings on each of three different poles, together with the time cycles within which the breaker or tripping de-

ELECTRIC TEST RECORD			
MULTI AMP PRODUCTIVE MAINTENANCE		OVERLOAD RELAYS - CIRCUIT BREAKERS	
ITEM	TEST	DATE	TIME
1	240 A	12-100	12:00
2	240 A	12-100	12:00
3	240 A	12-100	12:00
4	240 A	12-100	12:00
5	240 A	12-100	12:00
6	240 A	12-100	12:00
7	240 A	12-100	12:00
8	240 A	12-100	12:00
9	240 A	12-100	12:00
10	240 A	12-100	12:00
11	240 A	12-100	12:00
12	240 A	12-100	12:00
13	240 A	12-100	12:00
14	240 A	12-100	12:00
15	240 A	12-100	12:00
16	240 A	12-100	12:00
17	240 A	12-100	12:00
18	240 A	12-100	12:00
19	240 A	12-100	12:00
20	240 A	12-100	12:00

# "Electricity and Electrical Power"

**Basic information on the fundamentals of electricity  
for the first time available in ONE Volume!**

A limited edition of this important handbook has just been printed and is available to subscribers to SOUTHERN POWER AND INDUSTRY only. Order your copy NOW with a new or renewal subscription to this magazine.

A series of seven articles, "Electricity and Electrical Power" by Roy W. Wages, industrial engineer for Georgia Power Company, was published last year in SOUTHERN POWER AND INDUSTRY and received wide attention and favorable comment from plant engineers in the South and Southwest.

Demands for reprints of this series became so great that we have had all the articles bound in one volume. This useful 72-page book is now available to SOUTHERN POWER AND INDUSTRY subscribers exclusively.

In simple, practical terms, Mr. Wages makes clear the mysteries of electricity all the way from ex-

plaining and defining a volt to a discussion of the sine curve of alternating current motors. The book is liberally illustrated with diagrams and pictures which help make the text crystal clear. Throughout the pages, the author does everything possible to simplify the presentation of facts for easy study and understanding.

Here is a book you will want to keep for reference and for training periods. Pocket sized, it is convenient to carry anywhere . . . for checking right on the job.

All you have to do to own this valuable booklet is to check the coupon below now, and send it back to us. For three dollars, you get a three-year subscription to SOUTHERN POWER AND INDUSTRY *plus* "Electricity and Electrical Power"!

The editors will welcome you into the growing family of SOUTHERN POWER AND INDUSTRY readers.

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Firm..... Position.....

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## SOUTHERN POWER & INDUSTRY

806 Peachtree Street N.E.

Atlanta 5, Georgia

vice should interrupt at each rating.

The second or blue card in each pair (set up for each device or section) is for control of scheduling (weekly or by longer periods) of inspections over a 5-year period and for the posting on one side of the mechanical maintenance check list on motor starters, and on the other side for the mechanical check list on circuit breakers.

Cards are designed to serve as the work order for the mechanical phases (cleaning, oiling, minor repairs) and as review reports for the electrical engineer's or mechanical supervisor's authorizations for major repairs or replacements.

### Case 43—Florida Paper Mill

## Torque Motor Replaces Spring-Driven Reel

A TORQUE motor now replaces a spring driven reel previously used to pay out and retract electrical cable which supplies control power to motors within the grab from an overhead crane.

The torque motor is connected to the reel by a sprocket and roller chain. Its shunt field is maintained at full voltage. The armature also has a limited current at all times, providing a maintained torque great enough to support the weight of the entire length of cable, plus a margin to keep the cable tight.

When lowering, the cable is unwound against this maintained torque, but when raising an auxiliary relay bridges part of the resistance, allowing additional torque to help unwind cable at whatever speed the grab is raised.

A small braking force is required to prevent the reel from unwinding cable when torque is removed, as when the operator turns off the switch and leaves the controls. This is provided by a simple brake band held against the surface of the reel by a spring adjusted for the proper tension to support the weight of the cable when current is off the motor. A solenoid is connected across the



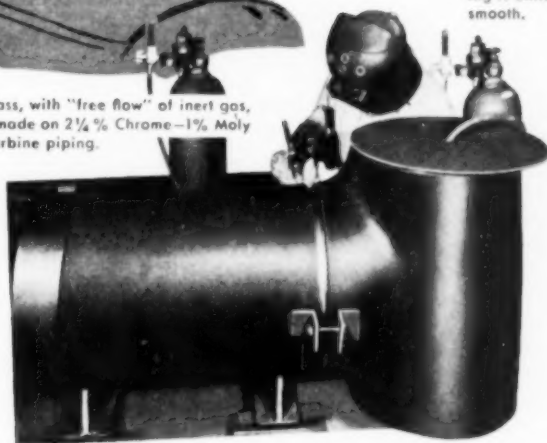
# INERT GAS TUNGSTEN ARC-WELDING ON HIGH-TEMPERATURE, HIGH-PRESSURE PIPING



*It's More a Matter  
of Skill Than  
Inert Gas Back Pressure*

Inside bead surface of root pass on 2 1/4 % Chrome-1% Moly steel turbine connection produced by P.P.&E. inert gas tungsten arc-welding is uniform and smooth.

Root pass, with "free flow" of inert gas, being made on 2 1/4 % Chrome-1% Moly steel turbine piping.



Inert gas tungsten arc-welding is one of many operations involved in the fabrication of high-temperature, high-pressure piping. Like the others its success is not assured by a single factor, but comes as a result of long experience with all manufacturing techniques and service requirements of power piping.

Simply protecting the internal surface of the root bead with inert gas under "control" does not take the place, for example, of skillful welding.

Pittsburgh Piping's process provides an inert gas shield against the atmosphere on both internal and external surfaces of the root pass. This procedure, combined with other P.P.&E. techniques, eliminates need for backing rings and double butt welding, and produces a sound, clean joint having a remarkably uniform root bead of correct internal contour.

Applicable to all types of power and process piping—inert gas tungsten arc-welding is another of the many advanced P.P.&E. techniques used in producing all types of power piping—as small as control lines, as large as steam mains.



Typical external surface of root pass produced by skillful inert gas tungsten arc-welder.

## *Pittsburgh Piping* AND EQUIPMENT COMPANY

10 Forty-Third Street—Pittsburgh, Penna.

Atlanta.....Whitehead Building	Cleveland...Public Square Building
Boston.....10 High Street	Houston...Hearst State Bank Bldg.
Charlotte.....221 Builders Building	Los Angeles 1830 N. Alexander Ave.
Chicago.....Peoples Gas Building	New Orleans.....P. O. Box 74
New York.....Woolworth Building	

PP-5

shunt field circuit to release the brake when current is on.

Four of these devices have been in operation for four months on a 24 hour schedule and so far have received only inspection. They have reduced maintenance from 8 to 16 hours downtime each week by eliminating need for replacing broken springs on the original reel.

By L. A. DANOS, Assistant Plant Engineer, St. Regis Paper Company, Bag Division, Pensacola, Florida.

#### Case 44—Texas Chemical

### Cost Reduction By Bearing Rotation

A GROUP of industrial gas engines developed minute fatigue cracks that could be found only on the top half of the connecting rod bearings. It was noticed that these cracks developed

after a period of operation of six months. Further operation produced bearing failures and shaft damage.

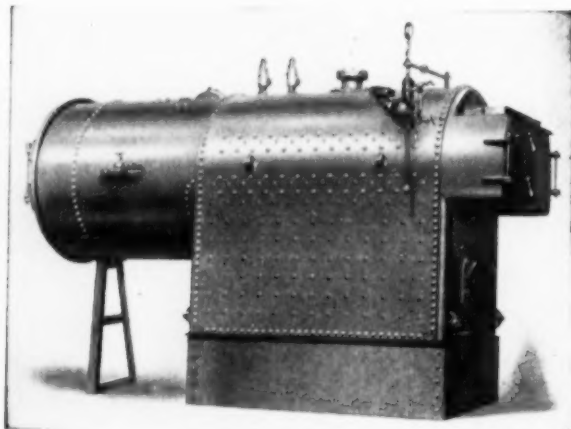
Until a solution could be found and proved, it became necessary to replace all bearings at six months intervals. This was a job requiring the removal of all cylinder heads and pistons, requiring about 250 man hours and \$1000 in parts with three days down time.

After a few machines had been overhauled in this manner, it was decided to do the remainder as follows:

Two special screw jacks were designed to support the connecting rods from the crankcase floor. With the use of these jacks, the bearings could be removed without removing either the cylinder head or piston. These bearings were then rotated 180° and reinstalled. This transferred the lead to the heretofore undamaged bottom half of the bearing, requiring no "fitting" or adjusting of shims. This doubled the life of the bearings. This method required only about twenty-four man hours, eight hours down time, and no parts if the job was done before any bearings had failed.

Method developed by B. J. WARREN, Maintenance Engineer, N. T. ACOSTA, Foreman, and O. D. O'BRYAN, Department Head, Gas Compression and Gas Cracking Unit, Carbide & Carbon Chemicals Company, Texas City, Texas

## POWER with POWER to spare



### A NEW DOUBLE PASS ALL-PURPOSE INDUSTRIAL AND HEATING BOILER

#### SOUTHERN MADE FOR SOUTHERN TRADE

Made in sizes from 44 H.P. to 153 H.P. S.B.L. rating with pressure to 150 lbs. Designed for coal, gas or oil firing, the New Lucey Double Pass Boiler can be furnished complete as a package unit.

This boiler is in addition to our regular line of single pass fire box boilers which we have been making since 1918.

WRITE FOR BULLETIN NO. 153 FOR COMPLETE SPECIFICATIONS

## LUCEY BOILER AND MANUFACTURING CORPORATION

CHATTANOOGA,  
1514 CHESTNUT ST.  
CHATTANOOGA

TENNESSEE  
1312 STERLING BLDG.  
HOUSTON, TEXAS

#### Case 45—Georgia

### Double Grounding of Return Welding Circuit

WHEN using arc welding transformers with the return lead connected to the work, the work should be grounded and the strap which connects the return welder terminal to the case of the transformer should be disconnected. This prevents welding current from traveling back to the return terminal by other paths and avoids the possibility of burning off the case ground.

By A. F. SCHLOTTERER, Electrical Engineer, General Electric Company Power Transformer Plant, Rome, Georgia

**They're  
Harnessing  
Cyclones....**

with **REPUBLIC**  
*Automatic*  
**COMBUSTION  
CONTROL**



● At a major chemical plant, the first 100% cyclone-fired industrial power plant in the country is being controlled for maximum combustion efficiency by Republic combustion controls. The plant produces 800,000 lbs. of steam per hr. at 1250 psi and 830° F. Steam is supplied to both chemical processes and to a 30,000 kw double-extraction turbine generator.

This cyclone-fired plant serves as *additional proof* that Republic combustion control systems can be adapted for any type of fuel firing.

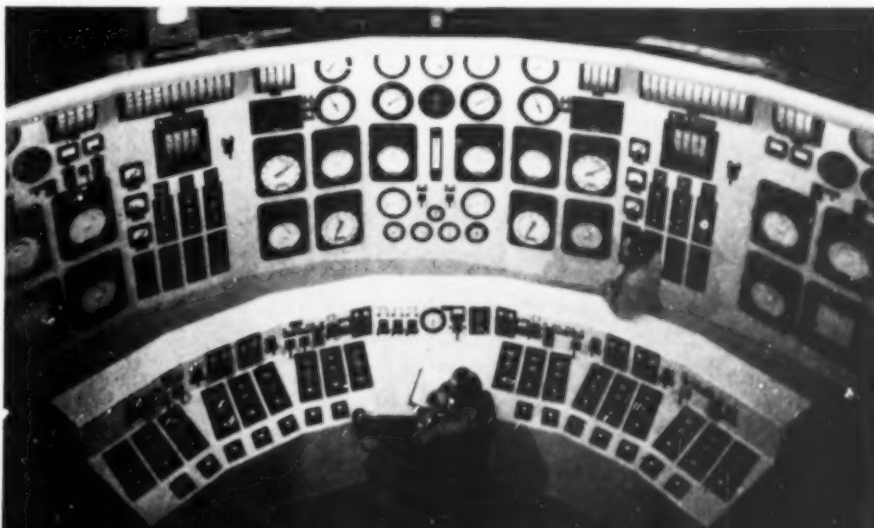
There are Republic combustion control systems for all sizes and types of boilers, all arrangements of draft equipment and for all load conditions. There's an experienced engineering staff\* to help you get the combustion control system that best fits *your* needs.

For full information, write for Data Book S-21 or contact your nearby Republic field engineer.

\*For more than 37 years, Republic has specialized in the design and manufacture of combustion control systems for all sizes of power generating stations.

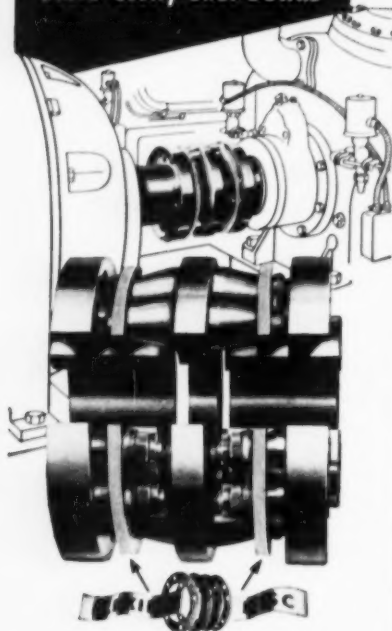
#### **FOUR CYCLONES AT HIS FINGER-TIPS . . .**

Two 400,000 lbs./hr. boilers fired by four cyclone furnaces are checked and controlled from this central control point. Republic sub-panels on the control bench board are provided for transferring between automatic and manual operation. Also included are Republic biasing sub-panels for adjusting coal-air ratio, primary-secondary air, cyclone ratio and boiler rating.



**REPUBLIC FLOW METERS CO.** • 2240 DIVERSEY PARKWAY • CHICAGO 47, ILLINOIS

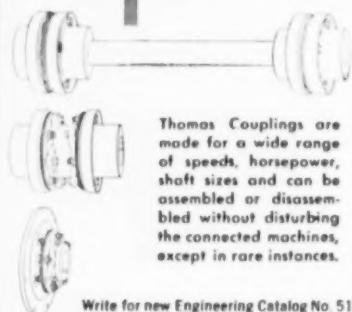
**Specify THOMAS ALL METAL FLEXIBLE COUPLINGS**  
for Power Transmission to  
avoid Costly Shut-Downs



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

**DISTINCTIVE ADVANTAGES**

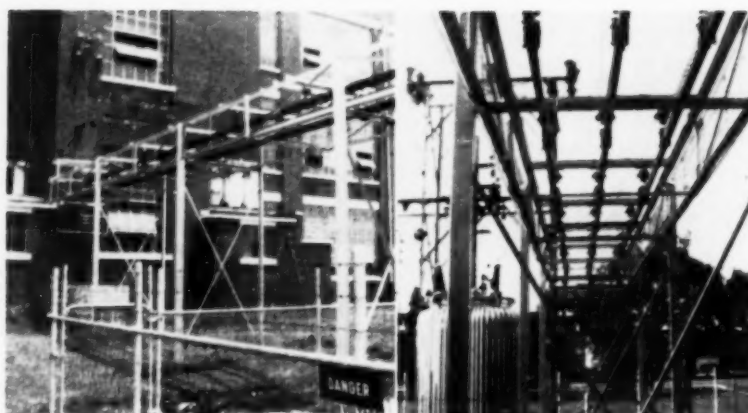
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to Cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower, shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

Write for new Engineering Catalog No. 51A

**THOMAS FLEXIBLE COUPLING CO.**  
WARREN, PENNSYLVANIA, U.S.A.



ORIGINAL installation of ten 3 conductor 600,000 MCM lead covered underground cables was replaced by this shop design angle iron structure supporting four 1/4" x 4" copper bars suspended on 750 volt outdoor type insulators.

**Case 46—Alabama**

**Eliminating Power Cable Failures**

OUR original power feeder installation from the power company's outdoor transformer station 440 volt buss to the feeder breaker switch room on the second floor of the mill building (approximately 52 ft), consisted of ten 600,000 MCM lead covered three conductor cables. They ran from the buss to underground cable vaults in conduit and then through fiber ducts underground to the basement of the mill building.

After ten years satisfactory operation we began experiencing cable failures. As the cables were nested together in the vaults, the fault in one cable would cause adjoining cable ruptures. Plant management realized that a serious cable rupture could cause a factory shutdown of considerable duration.

We compared the cost of cable replacement (with chances of repeat cable failures) with the cost of an overhead structure supporting 1/4" x 4" hard drawn copper bars of equal carrying capacity. The latter plan was adopted.

After the material was assembled, our maintenance personnel with the aid of a torch and electric welding machine, fabricated the structure. Only bolts used were for fastening insulators, buss and insulator clamps, and anchor bolts.

Change-over to the buss structure was made over the week end. Installation has offered satisfactory service for over fifteen years with only routine maintenance painting.

By H. C. NORMAN, Master Mechanic, West Boylston Mfg. Co., Boylston, Alabama

**Case 47—Alabama**

**Safety Control for Lubrication System**

HOW TO correct for the human element in regard to starting oil pressure presented a problem on our new 7 1/2 x 15 ft Allis-Chalmers ball mill.

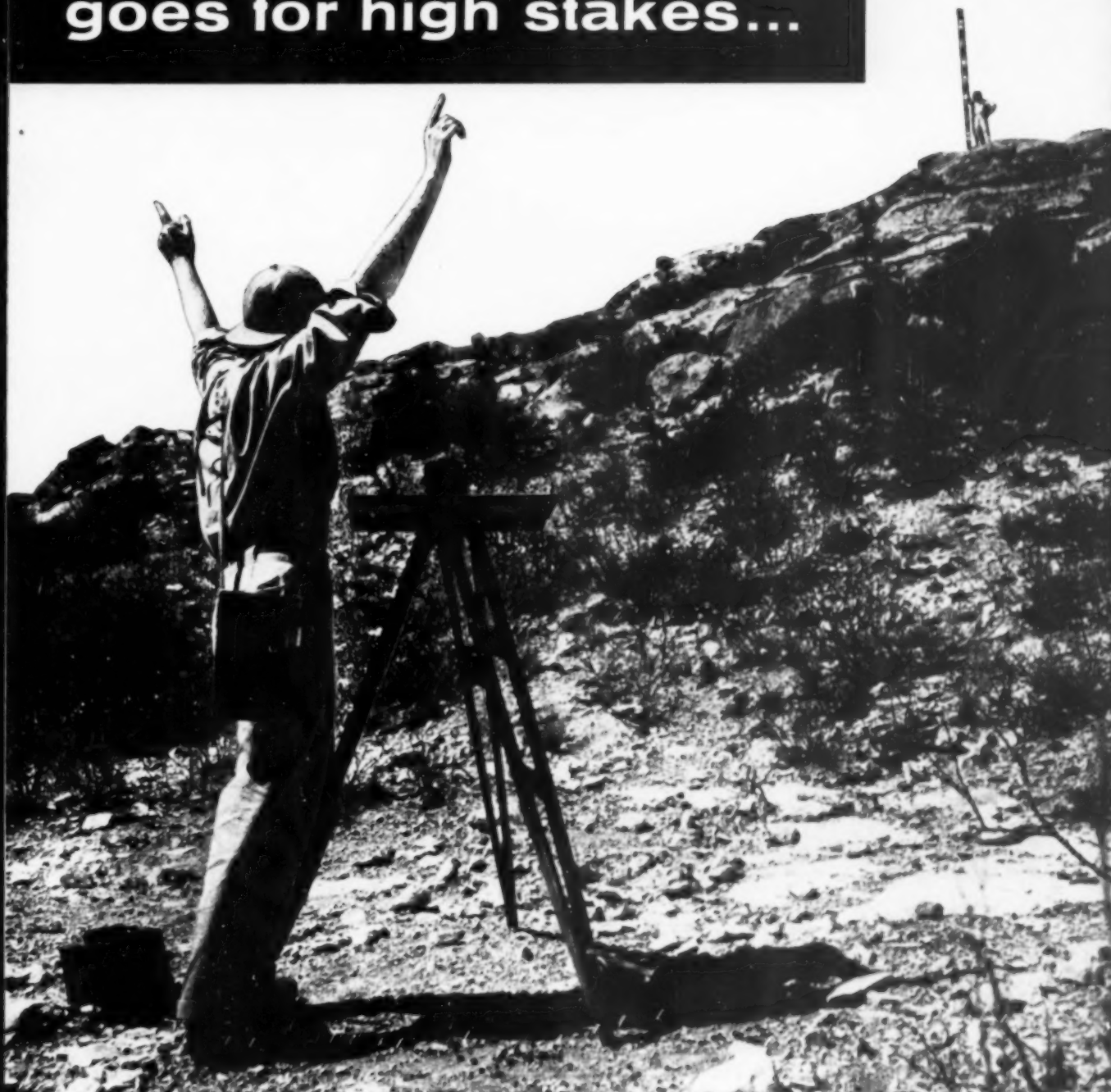
This unit was supplied with a very satisfactory oiling system, which consisted of shaft buckets dipping in the oil reservoir for normal operation and with a high pressure hand operated pump connected to the bottom of each journal for establishing positive oil film before starting the unit from rest.

**Starting Problem**

Our problem was to develop controls which would not permit the



# Cities Service goes for high stakes...



Test wells are put down on an average of one every 4 days by

**CITIES  SERVICE**

*A Growth Company*

unit to be started in case the operator forgot or failed to establish the starting oil film by manually operating the pumps, thus damaging the bearings on the first revolutions before the shaft buckets were supplying ample oil.

Since the auxiliary oil pump pressure dropped considerably before the magnetic clutch could be engaged, it was necessary to install a high pressure oil operated switch on each bearing through a

one minute time delay after energizing switch. A mercury switch was then installed in the starting switch which would close when the handle was moved to the running position. This was necessary in order to hold main switch energized after the one minute time delay switch opened.

#### New Operation

With this arrangement the clutch starting lever is not a circuit until

both bearing oil pressures reach 1000 psi and then the operator has one minute in which to energize the clutch before the circuit drops out. The mercury switch holding circuit of course must be energized from a point that is not hot until the time delay has allowed the breaker to close.

In addition to the above, thermostats were installed in both main bearing reservoirs connected to alarm horns for giving ample warning of excessive temperature before damage is done to the bearings.

With these additions we feel there is considerably less chance of accident to the bearings of the ball mill.

By M. L. LA RUE, Engineer, National Cement Co., Ragland, Alabama

#### Case 48—Texas

### Mechanical Packings

IN A Texas oil refinery there are five pumps handling 70 per cent HCL at 100 F, 3600 rpm, 75 psi. An average of three pumps a week used to be repacked.

Plant engineering personnel finally installed Garlock Packing Company's "Lattice Braid" blue asbestos packing with "Teflon" impregnation and have had to repack only one pump in three months.

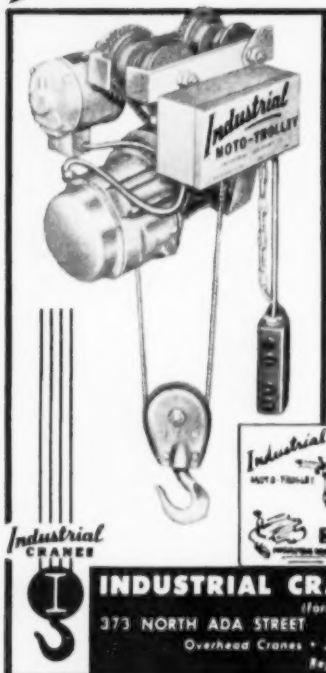
In the same plant they were receiving only eight hours service from a packing on a 2 in. shaft, 1750 rpm, handling caustics at 325 F and 50 psi. The same "Lattice Braid" packing was applied and the latest report is it has given 38 days service and is still satisfactory.

"Lattice Braid" is one of the latest Garlock developments in the "Teflon" field. The packings are now made of all-"Teflon" yarns with or without the "Teflon" impregnation.

"Teflon" is chemically inert to all materials except molten alkali metals, unaffected by the strongest acids, resistant to all organic solvents and alkali solutions, withstands temperatures of minus 90 F to plus 500 F. It has a low coefficient of friction at normal operating temperatures.

## Industrial MOTO-TROLLEY

The Original Packaged Motor Driven Trolley



**MAY BE ATTACHED TO  
YOUR STANDARD  
ELECTRIC HOIST...**

**Adjustable to Accommodate  
Wide Variety of Beam Sizes**

- Crown-tread machine steel wheels with hardened drivers.
- Each wheel equipped with double-row precision ball bearings and removable axle with Alemite grease fittings.
- Powered by a crane-duty high-torque totally enclosed motor of 30 minute 55 degree rating.
- Magnetic contact panel has transformer to reduce voltage in single speed push button control circuit.
- 4-button control station operates single speed trolley and hoist motions.

Write for Literature

**INDUSTRIAL CRANE & HOIST CORPORATION**

(Formerly Industrial Equipment Co.)

373 NORTH ADA STREET

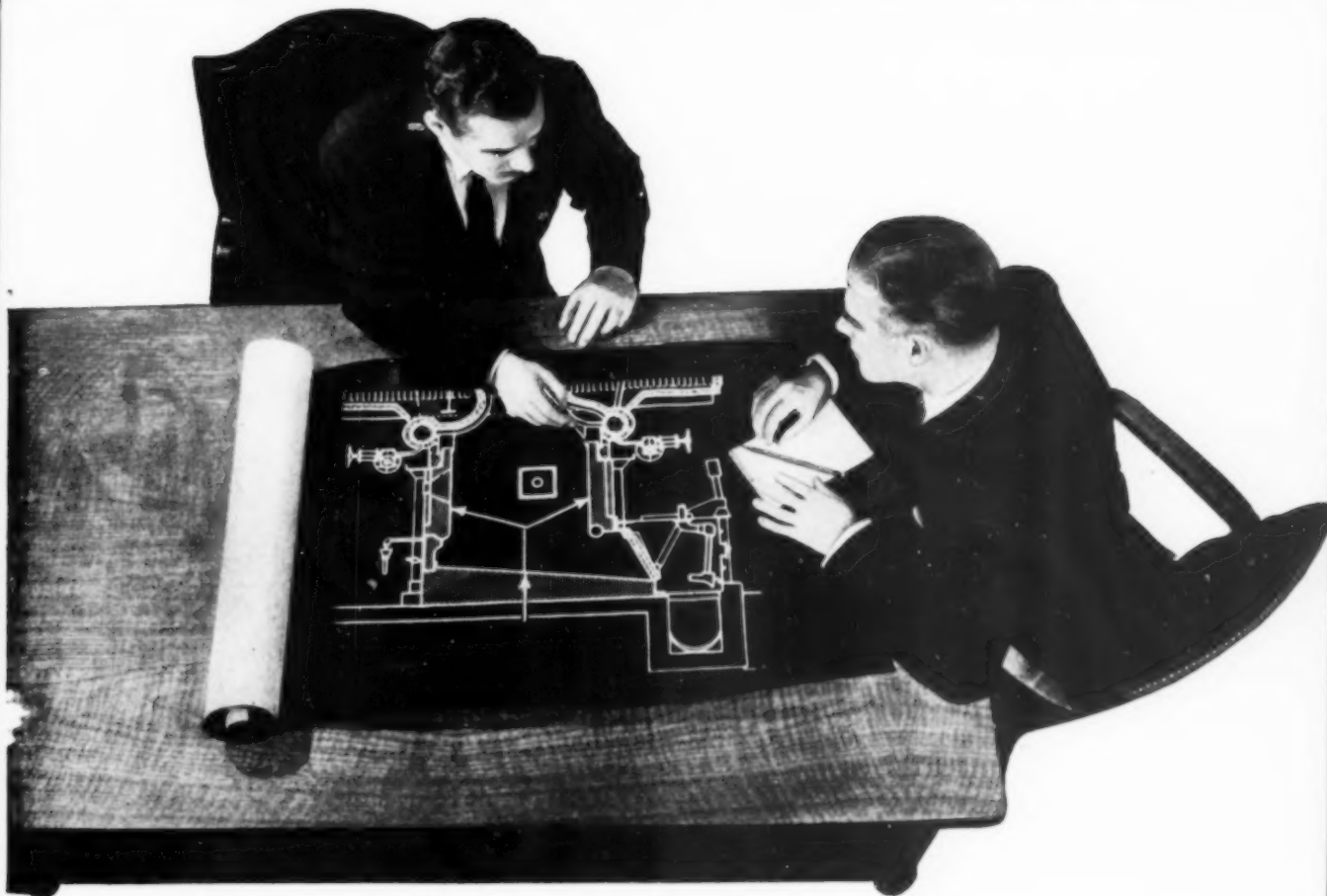
CHICAGO 7, ILLINOIS

Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways  
Representatives in Principal Cities

#### Southern Representatives are Located in

Atlanta	Mobile	Dallas
Jacksonville	Nashville	San Antonio
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Chattanooga	Memphis	Oklahoma City
Birmingham	Shreveport	Tampa
New Orleans		Miami

**Write for Name of Nearest Agent**



#### PROMINENT PUBLIC UTILITY

## *Cuts ashpit maintenance with B&W Refractory Concretes*

A trial installation of B&W Refractory Castable "A", a 2600 degree refractory concrete, was made in one boiler ashpit. To date this castable has given 25 months more maintenance-free service than the refractories previously used.

Results of this first trial were so encouraging that another ashpit, shown in the drawing above, was lined with B&W Refractory Castable "A". In this installation the two opposing high velocity water sprays cut refractories life two ways. First, water splattered on the hot walls (about 1800F) caused spalling. Second, the high velocity water jets had an abra-

sive effect on the floor refractories.

Here's the report: "After 20½ months service, B&W's Castable "A" lining was still in excellent condition—far superior to the refractories used before."

On the basis of these trials three other boiler ashpits have been lined with this 2600 degree castable.

In addition to ashpit linings, B&W Refractory Castable "A" is widely used in boilers for baffles, hearths, door linings, special shapes, repairing eroded brickwork and forming pier walls in stoker-fired boilers.

B&W Castable "A" is only one of

a line of B&W Refractory Concretes which cost-conscious boiler operators are putting to increasing use in many different applications. These B&W Concretes may help you cut installation costs and lengthen furnace life. Consult your B&W Field Engineer.



**B&W REFRACTORIES PRODUCTS**—B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick  
**B&W Refractory Castables, Plastics and Mortars** • **OTHER B&W PRODUCTS**—Stationary & Marine Boilers and Component Equipment...  
 Chemical Recovery Units... Seamless & Welded Tubes... Pulverizers... Fuel Burning Equipment... Pressure Vessels... Alloy Castings

B475A



## Section 6

# Production Equipment

### Case 49—Louisiana

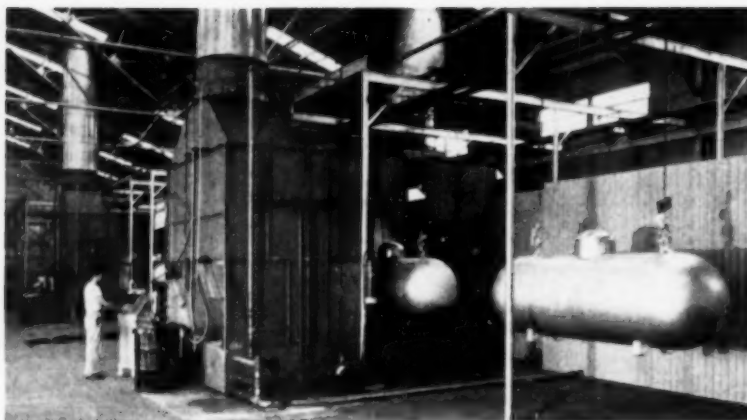
#### Quality Finish with Electrostatic Painting

A NEW \$40,000 electrostatic painting process is increasing production of LP-Gas systems and anhydrous ammonia equipment at the J. B. Beaird Company, Inc., Shreveport, Louisiana.

Credited with applying a more attractive and durable finish, the new painting process also effects a considerable saving in time and materials, according to Beaird officials. The electrostatic equipment was furnished by Ashdee Products, Inc., and the spray booth and spraying equipment by the DeVilbiss Company.

Electrostatic painting is the last step in the Beaird assembly line. Other steps which include hydrostatic testing, dehydration by Beaird's exclusive "Moisture Free" thermo vacuum process, installation of fittings and pneumatic buffing of metal surfaces.

Each painting chamber, one for applying the primer coat and the



90,000 VOLTS are used to apply paint spray to LP-Gas systems in the new electrostatic painting chambers at the J. B. Beaird plant. Beaird's stepped-up production line technique will turn out 17 LP-Gas systems an hour with the new painting process.

other for finishing, contains a battery of electronically-controlled spray guns. Triggered by photo-electric eyes, the guns bombard the air with paint spray charged with 90,000 volts, causing the spray to envelop the LP-Gas system.

#### Better Finish

Magnetic attraction, strong enough to turn the paint particles as much as 180 degrees, draws the paint to the metal surface, producing a uniform and more durable

finish, impossible to duplicate by hand spray methods.

Only a few minutes elapse from the time an LP-Gas system enters the primer chamber until it emerges from the finish chamber on its way toward final inspection and shipping.

The J. B. Beaird Company, one of the Southwest's largest metal fabricators, also produces packaged compressor plants, pressure storage tanks, and various types of cast steel fittings.



WEATHERPROOF LINE WIRE



SLEET AND SNOW severely test line wire. In foul weather or fair, DURALINE provides greatest service dependability.

## Here's how Anaconda's Duraline protects circuits

It cuts down outages and interferences in rain, snow and sleet

DURALINE\* is completely unlike any other weatherproof line wire. It gives the *finest* weatherproofing and has longer life.

Note its continuous sheath of interlocked and felted, fibrous material—thoroughly impregnated with URC saturants and finished with URC finishers. Only Anaconda makes a line wire with this type protection.

As a result, Duraline reduces grounds and shorts in wet, windy and icy weather. It protects against

contact with foreign objects. It eliminates festooning.

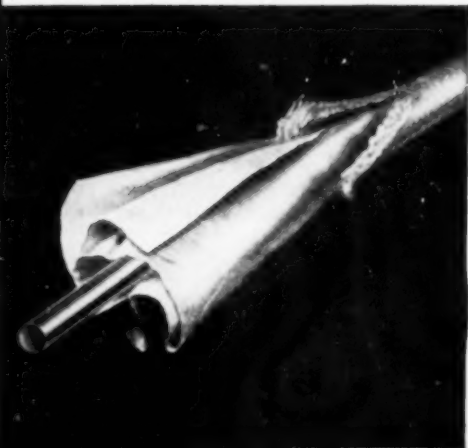
Ask your Anaconda Sales Office for full information. Or write Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

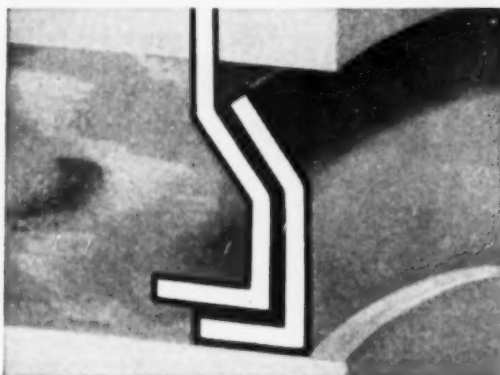
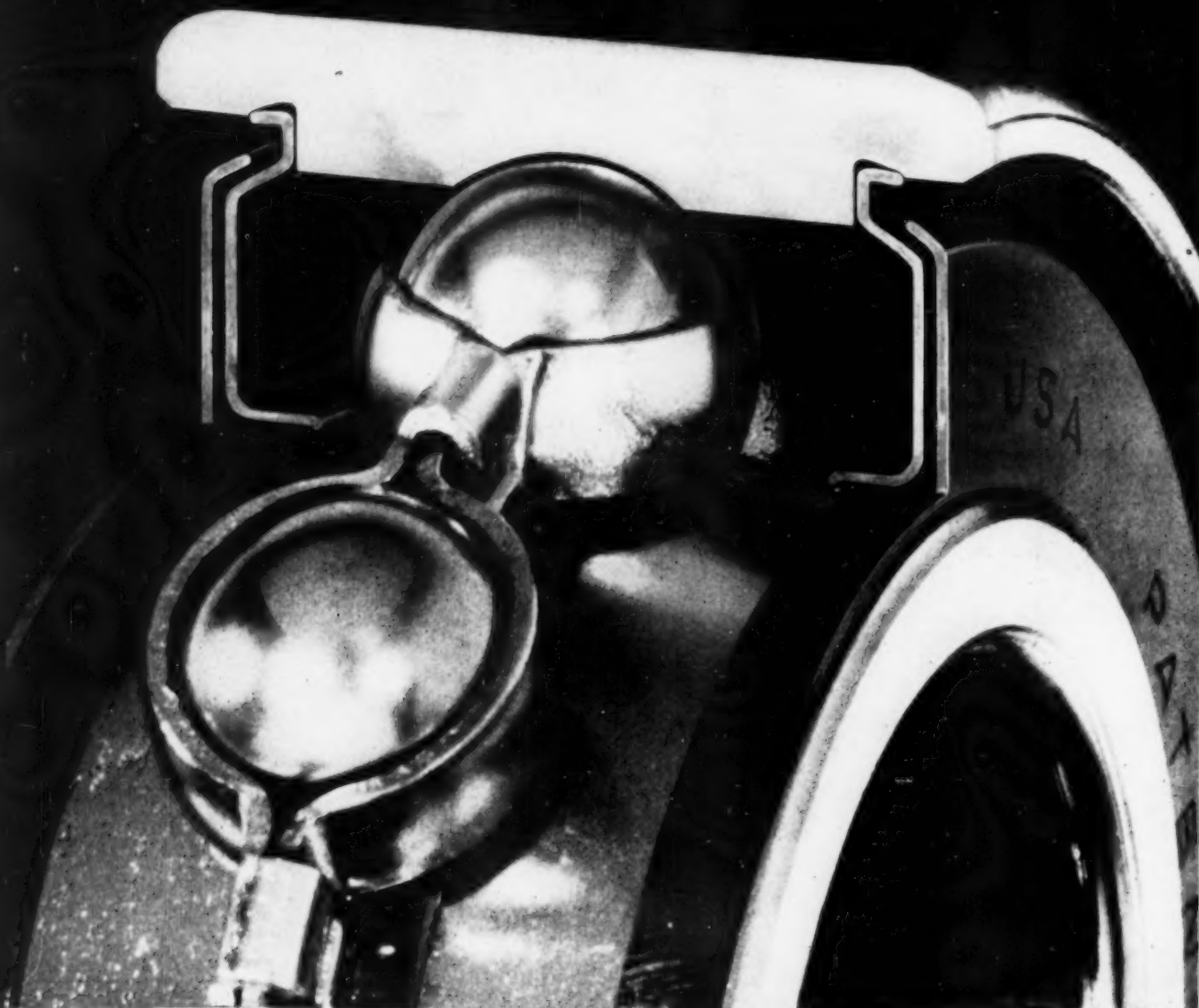
\*Reg. U. S. Pat. Off.

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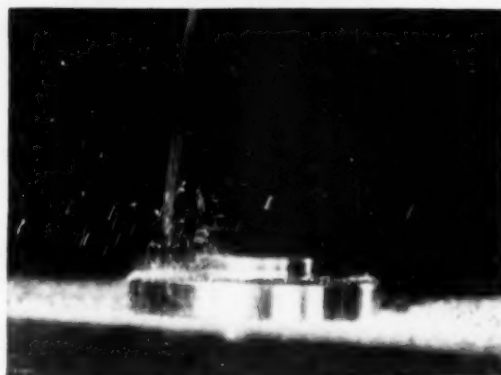
# ANACONDA<sup>®</sup>

Service and overhead distribution wires and cables, bare and weatherproof (neoprene, polyethylene and thermoplastic), including ACSB • signal, control and communication wire • portable cords and cables • mine cables • magnet wire • copper, aluminum and copperweld conductors • wire and cable accessories





**POSITIVE LABYRINTH.** A joint is only as effective as its seal. Countless research studies have shown that the labyrinth is one of the most effective ways to seal a joint where at least one member rotates. Further sealing action is achieved by the film of grease that fills the minute clearance between the two seals.



**FLINGER ACTION.** One of the most important functions of the outer rotating seal is to throw off any foreign element that tries to enter the bearing. This flinger action is achieved by the centrifugal force set up by the rotating seal. Elements attacking the bearing are repelled.

# Exclusive 4-way seal guards new ***Life-Line A*** bearing

Here's why you can count on reliable  
***Life-Line A*** motor performance



There are three factors that affect motor bearing life: (1) type of lubricant, (2) amount of lubricant, and (3) presence of contaminants. The one *sure* way to control all three is to use a bearing that is pre-lubricated at the bearing manufacturer's plant and then SEALED.

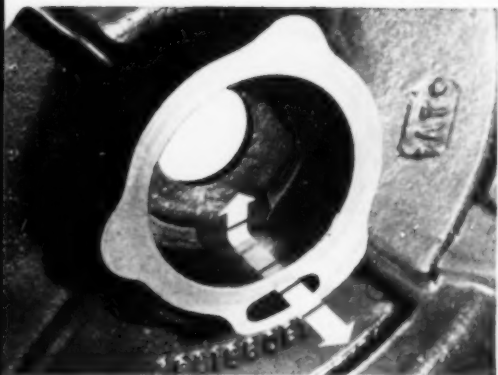
Many of the original Life-Line® pre-lubricated bearings installed in 1937 have been running ever since and are still like new. Now, Westinghouse offers another important step ahead... a pre-lubricated motor bearing that has *four* seals... two on each side. Here's

real bearing protection. Grease is sealed in. Contaminants are sealed out. No on-the-job greasing is required—EVER.

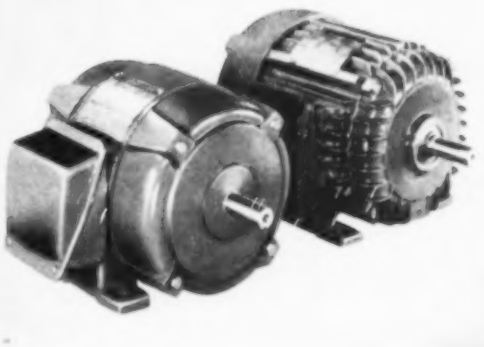
This new concept in motor bearings is one of the many improvements Westinghouse has incorporated into the complete, balanced design system that makes the Life-Line "A" motor your best buy. Get all the facts from your local Westinghouse sales engineer. Or write for Booklet B-6154-A. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-21849

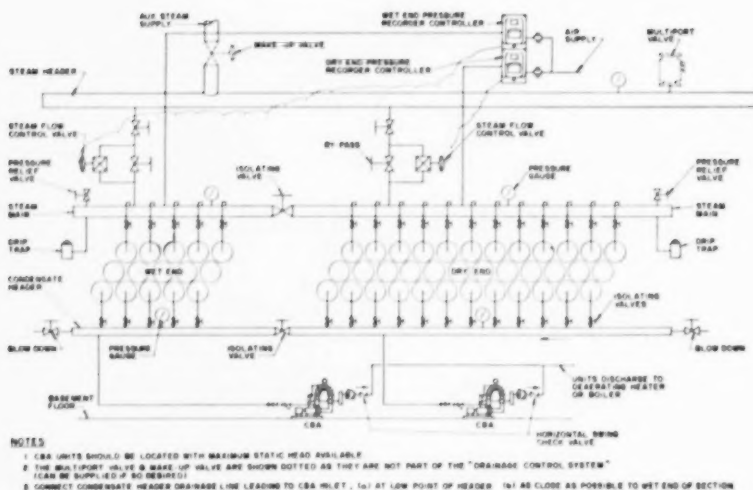
YOU CAN BE SURE... IF IT'S  
**Westinghouse**



**AIR BY-PASS.** Totally-enclosed motors "breathe" as the internal air expands and contracts with change in temperature. Ordinary motors "breathe" along the shaft and through the bearings. Life-Line provides an air by-pass around the bearings to keep out contaminating air.



The performance of any motor is dependent on the performance of each component of that motor. It takes balanced design. That's why every component in the new Life-Line "A" motor has been redesigned and integrated with the whole. The result is a motor with superior performance and consistent dependability.



### Case 50—Paper Mill

## New Performance for Old Paper Machine

IN ORDER to increase production of Boxboard at a paper mill in the South, the company purchased a new Horn paper machine consisting of 96 driers with open

"flash down" drainage system. This replaced an 86 drier machine that dropped off in production to the point where its disposal was seriously considered.

Since the old machine was of the conventional "flash down" type, it was suggested that Cochrane's C-B High Pressure Condensate Drainage Units might restore the production efficiency of the old machine.

Two units were bought—one handling 64 driers and the other handling 16 driers, operating at a pressure of 30 psi. The wet end section operated at a lower pressure. The C-B units were connected directly to the condensate manifold and the discharge to the deaerating heater at a pressure of approximately 28 lb and a temperature of 271 F.

After installation, the old machine was put into operation and actually competed with the new machine in quality and cost.

### Case 51—Virginia

## Pressure Washer Boosts Pulp Output

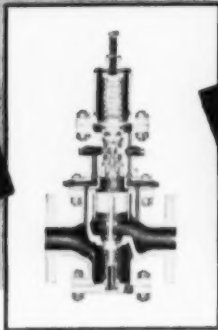
ONE of the methods by which a large Virginia pulp and paper mill has increased the output of kraft pulp is the installation of a Sutherland pressure washing system.

Each pressure washer consists of an 11 ft long screw or compression element, which rotates in an 18" diameter perforated cylinder with a minimum clearance. The trough area diminishes uniformly toward the discharge end, while the flange diameter is constant. The screw is so designed that the pulp moves in a straight line toward the discharge point, rather than rotate with the screw.

Stock from an underflow Valley thickener, at approximately 11% consistency, is fed into the first press. Filtrate from the second press is added for a final consistency adjustment. Stock discharges from the first press at about 37% consistency, is repulped with filtrate from the third press, and is fed into the second press. Each succeeding stage operates in the same way, except that at the last stage tail water from the screen room, at about 200 F, is

**For Regulation of Steam Pressures up to 1500 P.S.I.**

The  
**FOSTER**  
50-G2



Approaches  
Instrument  
Control

The Foster 50-G2 Pressure Reducing Regulator accurately holds reduced pressure at a steady level — from maximum capacity to tight shut-off — regardless of normal variations in initial pressure. Extremely sensitive throttling action means that there is never more than a small, momentary deviation from the set point. It is furnished arranged for self-contained operation or remote control, depending on pressure requirements.

Foster 50-G2 Valves need less maintenance because the materials used in their construction are resistant to erosion and corrosion of severe service conditions and they are further protected by internal

strainers. When servicing is necessary, it can be done without breaking the line, and it is made easier by interchangeable parts and assemblies.

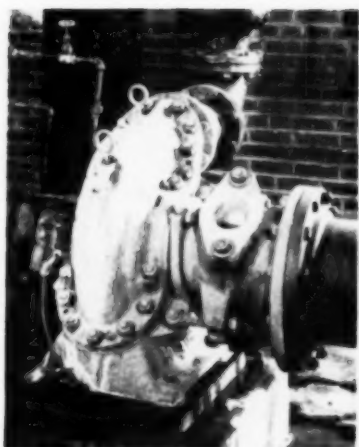
High inlet-to-outlet ratio often eliminates a secondary stage valve in supplying low pressure steam for such uses as deaerating water heaters, tank storage heaters and auxiliary exhaust systems.

Available for initial pressures 25-1500 P.S.I.; temperatures to 950° F.; reduced pressures from 15" Hg. to 600 P.S.I. Sizes 1/2" to 12". Write for Bulletin G-101.



**FOSTER ENGINEERING COMPANY**  
835 LEHIGH AVENUE UNION, N. J.  
AUTOMATIC VALVES • SAFETY VALVES • FLOW TUBES





**PRESSURE** washing system features Goulds pumps. This 6" pump handles 5% stock at 210 F from the blew tank to the pressure washing system.

used as the wash water. The gravity flow of the liquor is retarded to prevent entrainment of air.

Since high consistencies are used throughout this system, liquor volumes are small. This makes it possible to use smaller tanks, pumps, and piping, than are commonly found in a system of equivalent capacity. All pumps in the pressure washing system were supplied by Goulds Pumps, Inc.

The limited water requirements of the pressure system also mean that there is less dilution of evaporator feed, and more efficient heat recovery. And the fact that the system operates at pressure eliminates the foam problem.

### More Information Available

Many of these procedures and improvements, plant tested in Southern and South-western plants, can be put to work towards increasing production in your own plant. Case studies are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment manufacturers are identified in the articles. If additional information is desired, contact your local mill supply house, the manufacturer's representative in your area, the equipment manufacturer's headquarters, or write The Editors, SP&I, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.

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The PANALARM "50" Cabinet has a substantial hinged door . . . with sub-door to allow easy access to signal lamps. It has a new, rugged chassis design . . . pre-wired to handle any standard audio-visual signal requirement . . . and so flexible that signal sequences can be changed by simple terminal connections. No re-wiring is needed.

All moving parts and contacts of the PANALARM "50" are within hermetically sealed, plug-in units. They are corrosion-proof and suitable for Class I, Div. 2 locations. All connections are made to a single terminal block . . . with ample space for wiring.

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FOR ALL PRESSURES!  
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Available with screwed or socket weld ends. 3000-lb. sizes  $1/4"$  to  $3"$ ; 6000-lb. sizes  $1/8"$  to  $2"$ .



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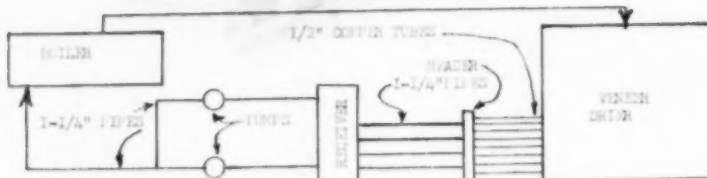
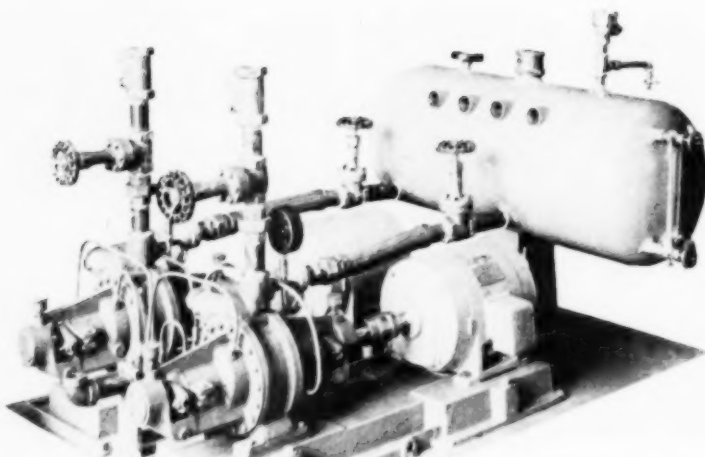
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STEEL UNIONS**

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**CATAWISSA VALVE &  
FITTINGS COMPANY**  
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Case 52—Tennessee Lumber Mill

## Condensate System Increases Veneer Output

THE Wilco-Stansbury Duplex Steam Saver System illustrated here is installed on a Coe Veneer Dryer at Nickey Bros., Memphis, Tenn., and is designed to return steam condensate at the pressure and temperature at which it is formed, directly to a 150 lb boiler without using traps. Motors are 5 horsepower. The tank is rated at 200 psi.

Condensate returns ( $1/2"$  lines) are piped into one header. Four  $1 1/4"$  lines connect the header to the receiving tank. Two pumps, individually motor driven, pump condensate back to the boiler. Each pump can handle the capac-

ity of the system. The interconnecting wiring can cycle the pumps and switch over to the other pump if either fails.

With the new system, we can get a higher infeed temperature and this enables us to feed veneer to the dryer at a faster rate and increase production. Furthermore, flash steam is saved and trap maintenance is eliminated.

The Wilco-Stansbury Steam Saver System is manufactured by Wilco Machine Works, Memphis, Tenn.

By HUBERT W. GRAY, Assistant General Superintendent, Nickey Brothers, Inc., Memphis, Tenn.

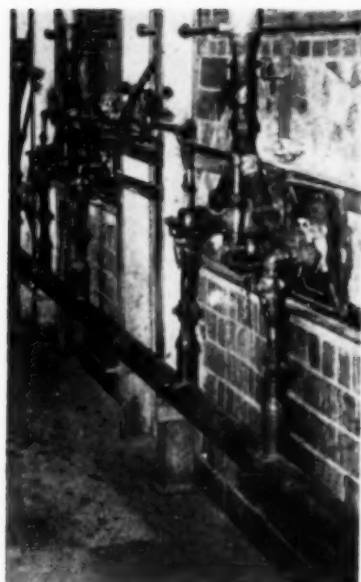
Case 53—North Carolina

## Kiln Fuel Conversion

THE Isenhour Brick & Tile Company in Salisbury, N. C., recently changed from oil to gas firing on both their continuous and periodic type kilns. Previously that company used fuel oil at a daily rate of about 7,500 gallons.

When plant expansion is completed, the company expects to reach a gas consumption total of 1,500,000 cu ft of natural gas daily. A production increase of about 50% will be had from the additional facilities in the expansion program.

On their continuous tunnel kilns, all of their Hauck Proportioning Oil Burners have been equipped with gas burning attachments and



PARTIAL view of one of the continuous tunnel kilns equipped with Hauck combination gas and oil burners at Isenhour Brick & Tile, Salisbury, N. C.

thus converted into the Hauck combination gas and oil type burners for burning either fuel as desired.

Their round down-draft or Beehive type periodic kilns were previously equipped with the Hauck Series "B" Oil Burners. These kilns have been since changed over for gas firing by being equipped with the Hauck Low Pressure Gas-Air Proportioning Mixers and "Retain - A - Flame" Gas Burning Nozzles.

Each of these mixers serves a multiple of the burner nozzles. The mixers are arranged for single valve operation in manual controlling over the entire range of air and gas capacity. A consistent air-gas ratio is automatically maintained by each mixer, throughout the range of capacity. The indicator dial for the single control valve on each mixer permits easily duplicated settings for desired heating rates.

The gas burning nozzles will retain the flame at their tips under unusual operating conditions. They are designed to produce a long cylindrical, torch type blast flame which permits heat to be distributed over a greater distance. Combustion takes place with good flame stability and with less noise.



## BELT CONVEYERS

*one of the many types of high-quality power and gravity conveyers in the MATHEWS Line*



The Belt Conveyor is one of the most efficient and commonly applied types of material handling equipment. It can be installed level, inclined, declined, or in a combination of these designs, and will operate well at any reasonable speed under complete control. The full line of Mathews Belt Conveyers ranges from standardized, general purpose units to highly complex, continuous flow conveying systems. When you have package handling problems, call in your nearest Mathews representative. Have him tell you more about Mathews Belt Conveyers and the other types of equipment in the complete Mathews line.

• Write for Bulletin G.P. 53, giving details on the Mathews General Purpose Belt and Live Roller Conveyers . . . or for Catalog No. 853, featuring numerous installations that could possibly offer a solution to your conveying problem. Both are yours for the asking.



## MATHEWS CONVEYERS

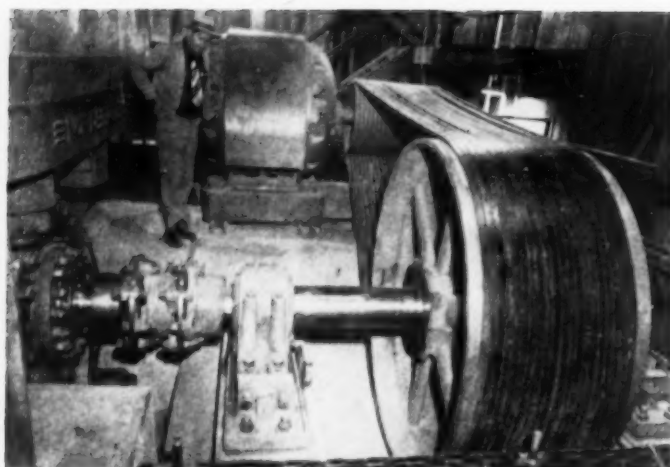
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ATLANTA OFFICE AND WAREHOUSE—1389 SPRING ST. N.W.



Case 54—Mining Operation

## V-Belts Drive Giant Crusher

ONE of the world's largest gyratory crushers, operated by the Climax Molybdenum Company, handles up to 30,000 tons of highly siliceous granite rock per day. Driven by 20 extra-duty Durkee-Atwood V-belts, the 60" Nordberg crusher has been in steady operation since February, 1953, crushing over 4,560,000 tons of ore without belt trouble.

## Case Study—Oklahoma

### Fewer Motor Burnouts

AT Commander Mills, Inc., Sand Springs, Oklahoma, we have a thousand looms, 90 of which are powered by 1 hp motors, 180 by 1½ hp, 100 by ½ hp and 630 by ¾ hp. Prior to 1949 several hundred of these were rewound each year. In fact, they were carried out by truck loads to the motor rewind shop.

We started using Fusetron Fuses (Bussman Mfg. Co.) in the winter of 1949 and began to keep individual records on motors. The reduction on motor burnouts was immediately noticeable. In 1950 only 44 loom motors were repaired.

There is no way to know how much damage was done to motors prior to our new maintenance system, but it is my belief that some motor repairs now are due to partial damage done prior to 1949.

In the entire plant we have over 2,500 motors, representing a little more than 5,000 hp connected load. The following list shows our actual expenses on motor repairs.

Year of Repairs	Number of Motors (No Record Kept)	Amount
1949		\$6,804.00
1950	87	2,796.20
1951	59	2,640.44
1952	63	2,165.63
1953 (1st 6 mo.)	23	445.84

	Number of Motors	Date of Repairs	Amount
Breakdown of Record for Motor Repairs for Past 6 Months:	3	Jan.	\$ 76.37
	4	Feb.	88.62
	3	Mar.	70.62
	4	April	87.75
	4	May	101.86
	2	June	20.62
			\$445.84

Note that loom motor repairs in 1949 cost us \$6,804. But for the first six months of 1953 our cost was only \$445.84.

By WM. B. PEACOCK, Chief Electrician, Commander Mills, Inc., Sand Springs, Oklahoma

## Case 55—Virginia

### Production Versatility With Four Basic Units

THE Foldaway Stairway Company of Portsmouth, Virginia, manufactures the popular Myers-Lee Disappearing Stairs. J. P. Myers, partner in the firm, considers a wise choice of initial equipment the first and probably the most important decision to be made in the production of folding stairways. In the selection of equipment, of course, other factors such as efficient materials handling, adequate ventilation and dust control, and proper manpower utilization must also be considered, and often substantially affect the ultimate choice.

The basic production machines at the Foldaway Stairway Company are a series of four DeWalt radial arm type woodworking machines. These machines, primarily specialized circular saws, are quickly and easily converted for other operations when necessary. This versatility, along with other considerations such as speed, accuracy, safety, maintenance, and economy, was one of the major factors influencing their selection.

Two of the DeWalt machines (3 hp models) are equipped with



J. P. Myers, partner in the Portsmouth, Virginia, firm, operates the DeWalt cut-off saw equipped with an automatic cross feed device of his own design. Machine is used for the cutting to length of all material used in manufacture.



dado heads instead of the standard saw blades, and are used for making the 30-degree right and left hand miter dado cuts on the ladder stringers of the stairways. These cuts must, of course, be perfectly precise so as to fit tightly with the cross treads of the stairs. Mr. Myers has found that the DeWalt machines are ideal on this score.

A third DeWalt radial arm machine, equipped with saw blade and automatic power cross feed, is used for the cutting to correct length of all the component parts of the Foldaway Stairs. Although the manufacturer of the saw offers a power cross feed device for the machine, the one used by Myers is his own design and works excellently for the particular application in his plant.

This mechanical ingenuity in adapting standard equipment to meet individual needs is another factor which frequently can be applied in wisely selecting production equipment. It is often true that a piece of equipment is used to only a fraction of its potential output simply because the owner lacks the imagination to visualize full utilization, or fails to use the imagination he does possess.

The fourth DeWalt machine is used for all "auxiliary" operations in the plant, such as ripping, mitering and bevel cutting. In many cases, too, when a particularly heavy demand causes one of the single purpose tools in the plant to be inadequate, this fourth radial arm machine is pressed into service to supplement the output. Here again, the wise choice of equipment allows Myers to make the most of the versatility provided in his machinery, thereby reducing the need for additional tools which would stand idle except during "rush" periods.

To supplement the production of the DeWalt machines, the Myers-Lee firm uses a multiple spindle drill press, a custom-designed router, and a power-feed high speed shaper. Throughout the plant, specially designed jigs and fixtures are provided for all operations.



## **Thirty Million B. T. U. CAPACITY** **with Precise Control** **of Temperature in Cooling**

The NIAGARA Aero HEAT EXCHANGER cools liquids and gases by evaporative cooling with atmospheric air, removing the heat at the rate of input, controlling temperature precisely. You save 95% of cost of cooling water; you make great savings in pumping, piping, power; quickly recover your installation cost.

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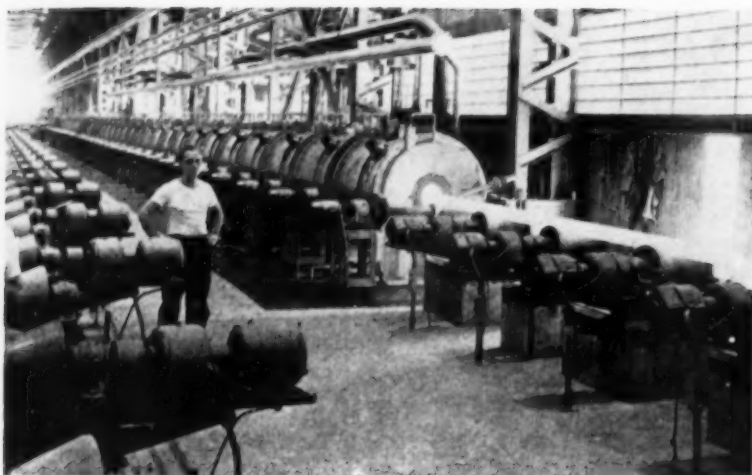
Write for complete information; ask for Bulletins 120 and 124. Address Dept. SP.

## **NIAGARA BLOWER COMPANY**

405 Lexington Ave.

New York 17, N. Y.

*District Engineers in Principal Cities of United States and Canada*



Case 56—Texas Steel Plant

### Continuous Normalizing of Welded Pipe

**N**ORMALIZING all-welded pipe, for oil country operations, at the Lone Star Steel Company, Lone Star, Texas, by using high speed gas heating with in-line continu-

ous furnaces, has resulted in increased production, flexibility of operation and superior product, all of which have been reflected in substantial savings of time and

money. The process and equipment was conceived, designed and built by the Selas Corporation of America, Philadelphia.

Two continuous lines are in operation, each consisting of 33 barrel-type furnaces, divided into independently controllable temperature zones, capable of raising the temperature of pipe from room temperature to 1700 F in 66 seconds. In one line, sizes of pipe processed range from 4½ in. to 16 in. O.D., at rates from 40 to 120 fpm, depending on the speed required by the welding operation preceding normalizing. This represents normalizing production rates (when synchronized with welding speeds) of 3000 lb of metal per minute. The other line normalizes 1.90 to 6.625 in. O.D. pipe, at speeds of 50 to 150 fpm.

Short cycle normalizing produces full solution of the carbon, resulting in a finer grain structure with subsequent higher hardness, strength and yield-tensile ratio, with but slight lowering of ductility. A minimum of surface oxidation is formed, because of the short time under heat and the complete envelopment of the pipe by the products of combustion. Since the individual heating chambers are small, fuel consumption to maintain furnace temperatures is less than with conventional furnaces.

Normalized tubular products produced by the short cycle gas radiant heating method pass all flaring, flanging and crushing tests specified by the American Petroleum Institute without splitting at the weld.



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**SAVE at the  
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Repacking time costs money! That's one reason why it pays to specify Durametallic self-lubricating, long lasting packing for your specific sealing need.

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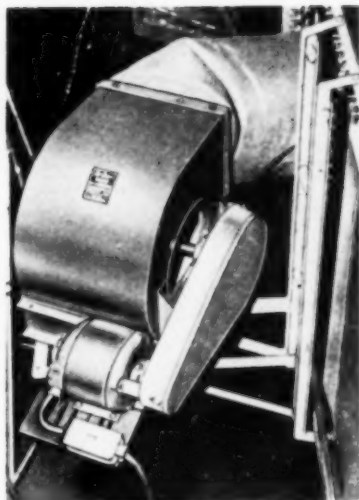
**DURAMETALLIC CORPORATION**  
KALAMAZOO MICHIGAN

Case 57—Texas

### Blowers Remove Fumes

**B**LOWERS of the double inlet type are in use to solve a critical production problem at Convair in Fort Worth, Texas.

In assembly of the wing fuel tanks of the B-36, a highly volatile material called "guk" is used. In processing it gives off obnoxious, unhealthy fumes, and the mechanics working in the wing sections



must have a supply of fresh air to drive these fumes away so as to stay with their work. Without a lively change of air they would be unable to remain in the wing during this operation.

So blowers, 9 $\frac{3}{4}$ " wheel diameter, with  $\frac{1}{4}$  hp motors are mounted to force a continuous supply of fresh air down through the wing section. Results are quite satisfactory and the operation on the whole rates high, as the blowers are relatively small and the mounting is simple and uncomplicated.

The blowers are Hy-Duty brand, made by Schwitzer-Cummins Company.

#### Case 58—Tennessee

### Welding Thin Sections

THE Knoxville (Tenn.) Orthopedic Appliance Co. is satisfied with procedures All-State Welding Co. worked out to solve problems in connection with use of stainless steel, aluminum and other metals in appliance manufacture.

The workmen were trying to use conventional welding materials and methods on very thin light sections where strength and durability are essential and joints must be invisible.

These troubles were eliminated by standardizing on newer methods made possible by only three All-State welding alloys and their companion fluxes.



## This is no accident!



Here's perfection . . . down to the last morsel! No slap-dash guesswork here. Into this masterpiece have gone the finest of ingredients, precisely blended with the special skill of the master-baker.

In the same sense, Plibrico specialists blend superior refractory materials . . . for *your* needs.

But as with fine pastry, dough alone doesn't finish the job! So Plibrico engineers work with you from the grassroots level, blueprinting plans best suited to your problems. Finally, expert crews complete construction efficiently and economically. For superior service, call for *Plibrico* . . . where you *know* you're getting your money's worth!

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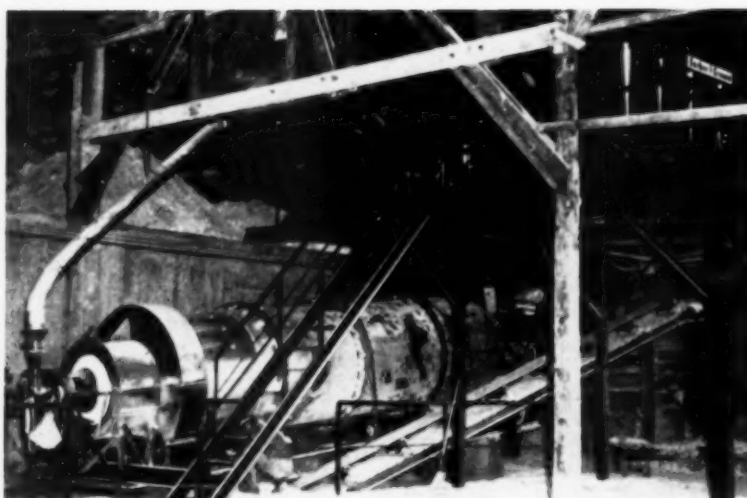


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**LUBRIPLATE DIVISION**  
Fiske Brothers Refining Co.  
Newark 5, N. J. • Toledo 5, Ohio



DRYER, normally part of a black-top mixing plant, has been adapted for reducing moisture content of Dolomite. Barber-Greene dust collector reclaims fine sizes and returns them to storage.

## Case 59—Florida

### Asphalt Dryer Adapted to Dolomite Production

AT THE plant of a Dolomite producer in West Central Florida, a problem presented itself in reducing the moisture content of the raw Dolomite before processing into fertilizer.

Ranging in size from 8" lumps downward to dust, the Dolomite, fresh from the quarry, contains as much as 21% moisture. It was the producer's desire to remove 10 to 11% of this moisture at a capacity of not less than 40 tons per hour.

Conventional driers for work of this type, and in the desired capacity range, employ drums of relatively small diameter, but of great length, often as much as 60 ft. Building limitations made this drum length undesirable.

The producer elected to adapt a Barber-Greene Model 835 Dryer to the job. This unit, normally used as part of an asphalt mixing plant to dry and heat the aggregate prior to mixing it with the bitumen, utilizes a drum of 5 ft diameter, only 20 ft long. For drying efficiency, it relies, not on length, but on a greater free fall period, during which the particles are suspended in a blast of hot air and flame from an oil burner.

#### Performance Data

Using Bunker "C" fuel oil, the first run of the Barber-Greene dryer netted 42 tons per hour, removing 11% of the moisture. No contamination of the Dolomite from carbon in the fuel oil was reported.

Succeeding operation has often reached 50 tons per hour, although the system is set up for a continuing capacity of only 40 tph.

A dragline brings the raw Dolomite from the quarry to concrete storage bins on the second story of the processing plant. A smaller dragline brings the material from these hoppers to the feed end of the dryer. Emerging from the dryer, the Dolomite is borne by conveyor to a hammermill, thence via bucket elevator to final storage bunkers. From this point, loading into railroad cars or trucks is by gravity.

In addition to the dryer, a Barber-Greene Model 852 Dust Collector is used. The residual moisture in the Dolomite prevents any dust problem; however, the collector is used principally to reclaim the fine sizes which would otherwise be driven off in the dryer's exhaust. This exhaust is piped



into the collector and reclaimed in the cyclone collector units, then the fines are carried by a covered screw conveyor into the bucket elevator which serves the final storage silos.

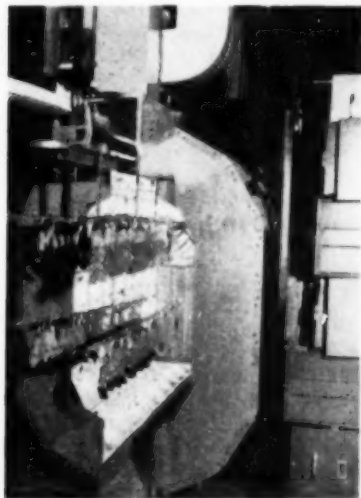
#### Case 60—Tennessee

### Infrared Oven Speeds Finishing Operations

A MODERN infrared oven installation is paying off for the Anderson-Hickey Co., Nashville, Tennessee, fabricators of metal filing cabinets.

A 14' 8" Fostoria Pressed Steel unit bakes paint on the metal filing cabinets, up to and including 5 drawer size. All parts are baked in the same oven at the same time cycle. Items include cabinets, drawers, drawer gliders, slide frames, dividers and brackets. Metal thicknesses vary from 28 gauge to 1/4". Baking time cycle is 5 1/2 minutes.

Since the installation of the new baking oven, Anderson-Hickey was able to increase production from 5 complete cabinets per hour to 11 per hour. Former drying time factor of 30 minutes was cut to 5 1/2 minutes. Interior cabinet fittings which were formerly baked separately are now baked inside the cabinet. Quality of the baked finish has improved considerably.



Fostoria infrared oven at the Anderson-Hickey Co. plant in Nashville.

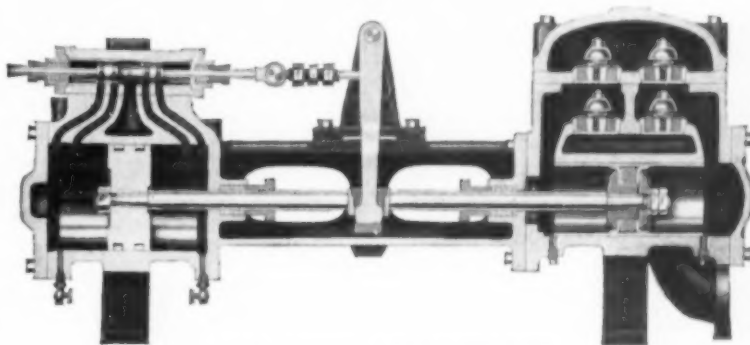
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"For FREE"

### Via WARREN "Realwear"

## Horizontal Duplex Steam Pump with Piston Valve Steam Chest

featuring special steam piston ring and steam chest piston valve ring construction, in addition to balanced steam chest piston valves and graphitic iron liners.



#### NOTE THESE ADVANTAGES:

- Oil-free exhaust steam.
- Clean exhaust steam for any purpose.
- Protection of boilers.
- No contamination of returns.
- Economy . . . 95% recovery of fuel cost when exhaust steam utilized.
- Reliability . . . not dependent upon electricity.
- Flexibility to meet varying load conditions with efficiency at all points.
- Adaptability to either manual or governor control and to long periods of shut-down, if necessary, without addition of oil or graphite.
- Elimination of any type lubricator.
- Outside valve adjustment.

This construction can save you money on Boiler Feed and all Steam Processing applications.



# WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC.

Warren, Massachusetts

# Equipment..Supplies..Methods

FOR FREE INFORMATION—Circle code number on page 17 or 18

## Portable Maintenance Inspection Tool & Kit

**K-1** MAGNAFLUX CORPORATION, 7300 W. Lawrence Ave., Chicago 31, Ill., has introduced an entirely different magnetic particle inspection kit which offers light weight, portability and low cost.



Magnaflux Yoke being used to inspect part of fatigue drill joint. Note clear sharp indications of fatigue cracks. Yoke Kit, (\$185.) will supplement the more elaborate inspection equipment which is currently available for this type of work.

This Y-5 Yoke Kit comes in a metal carrying case, about the size of a fishing box, and weighs less than 30 lb., complete. The Yoke itself is the magnetizing and testing instrument and weighs only 7 lb. Magnaflux powder, powder bulbs, and operating instructions complete the kit. The Yoke is equipped with a 100 ft cord. It draws only 6 amps from any 110 volt a-c line.

One man performs the inspection by himself. He handles the Yoke with one hand, both power control and positioning, and with the other he dusts on the Magnaflux powder. The area covered by each application of the Yoke varies up to approximately 24 sq in., and the Yoke is so light and easily positioned that large areas, many parts, or many feet of welds can be inspected per man hour.

The kit is designed especially for preventive maintenance inspection, for weld inspection, and for limited volume inspection of any magnetic part wherever surface cracks are suspected. This use is very pertinent to salvage operations.

## Lightweight Electric Hoists

**K-2** SHAW-BOX CRANE & HOIST DIVISION of MANNING, MAXWELL & MOORE, INC., Muskegon, Mich., have announced a new, lightweight, small, push-button controlled electric hoist of the wire rope and drum type.



Series "600" Load Lifter Hoists available with lug, upper hook, and trolley suspensions in capacities of 1000 and 2000 lb.

Construction features include frames made from aluminum alloy; alloy steel heat treated gearing with machine shaved teeth; double brakes; magnetic control with only 24 volts at push-buttons; machine grooved drums of large diameter; interchangeable suspension and positive upper stop to prevent overtravel of hoist hook.

## Safety Hook for Hoists

**K-3** COFFING HOIST COMPANY, Danville, Ill., has developed a new safety hook that is said to not only offer greater safety to both men and equipment during lifting operations, but is also simple and convenient enough so that hoist operators will make full use of its safety locking feature.



Coffing Safety Hook features: positive lock as the latch fits over the point of the hook and can't swing off; tip of latch is rounded so that it will shed wires, etc., rather than snagging them; full throat (when latch swings up) allows full use of area inside the hook.

Once the hook is engaged, a stamped steel latch swings down and is securely held in place by a lock that is under spring tension. There can be no movement of the latch sideways because it fits snugly over the point of the hook. Slight pressure on the release unlocks the latch, and spring tension on the release holds the latch open.

## Flexible Ducting for Air Conditioning Systems

**K-4** FLEXIBLE TUBING CORP., Guilford, Conn., has developed a new type of flexible ducting made out of woven glass fabric, galvanized spring steel and aluminum sheeting.

Called Thermaflex A, the tubing is constructed of a continuous galvanized spring steel helix covered with a permanently bonded three-ply laminate of Hess, Goldsmith No. H.G-12, 26 and 28 glass cloth sandwiched between two layers of aluminum sheet-

ing. The aluminum is bonded to the woven glass fabric with a specially developed resinous elastomeric compound which also binds the aluminum to the wire helix.

The principal advantage of the new tubing is its ease of installation. Special fittings are not required and the flexibility of the tubing does away with the fabrication of elbows and joints and the possibility of leakage at the joint.

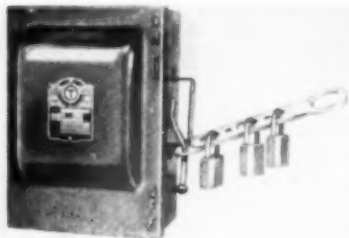
Layouts need not be as precise as with rigid ducting because Thermaflex A compensates for fractional differences in measuring as well as misalignment between the main line and soundbox or diffuser.

Available in 12-foot lengths and diameters of two to ten inches, it will withstand a hydrostatic pressure of 59 psi and will function within a temperature range of zero to 250 F.

#### Lockout Device for Switch and Fuse Boxes

K-5

INDUSTRIAL PRODUCTS  
COMPANY, 2892 N. Fourth  
St., Philadelphia 33, Pa.,  
announces a new lockout device for  
electric switch and fuse boxes.



When a number of workmen are engaged in repairing, oiling or adjusting a machine where the electric power comes through a common switch box, one of these workmen may throw the switch without knowing that other men are working on the same machine. The Safety Multiple Lockout is designed for use with padlocks and keys for the individual workers. As a means of identification, locks may be painted various colors to indicate types of draft or to signify different shifts.

The new safety lockout is fabricated of cold rolled steel and is zinc iridite plated. Two pieces of formed and punched steel are riveted together at the center to open and close in scissors fashion to securely lock the jaws of tool around switch levers, handles and lock holes. The device has  $\frac{3}{4}$ " matching holes to accommodate up to six padlocks.

# DIXISTEEL

TRADE MARK

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DIXISTEEL merchant bars are quality-controlled from start to finish. At each step of production — from molten steel to the finished hot-rolled product — checks and rechecks are made to assure proper physical properties, finish and tolerances.

DIXISTEEL Bars and Shapes are produced in a wide variety of shapes, sizes and grades — plain or galvanized.

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## Atlantic Steel Company

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**LOWELL WRENCH CO.**

WORCESTER 8, MASS.



No—but it's

still the one people want . . .

## Equipment . . Supplies . . Methods (Continued)



### New Type Bucket Steam Trap

**K-6** PERFECTING SERVICE COMPANY, 332 Atando Ave., Charlotte, N. C., has introduced a new type bucket steam trap, manufactured under the trade name "Uni-Trap".

The unit employs a balanced valve principle. It automatically operates through complete pressure ranges up to 250 psi without adjustments, changing orifices, or valves. Only the pipe size is needed to specify requirements.

The Uni-Trap is especially suited to process industries where load and pressure range vary. Greater capacities of condensate are handled through extra large orifices. The unique "Dual-

Valve" makes possible universal application. When the trap is filled with condensate, the bucket opens a small pilot valve, equalizing the pressure on both sides of the large main valve; the pressure immediately becomes balanced and allows the bucket to continue its descent and open the large capacity valve, thereby discharging the condensate rapidly.

The new trap is made in two styles—the standard, bottom inlet and top outlet type; and the in-line unit, that may be repaired without removing from steam line.

All internal parts are made of stainless steel; valves and valve seats are 500 Brinell hardness. The unit is available in pipe sizes ½" through 2".

**FOR FREE INFORMATION—Circle code number on page 17 or 18**

### Oil & Moisture Separator For Compressed Air Lines

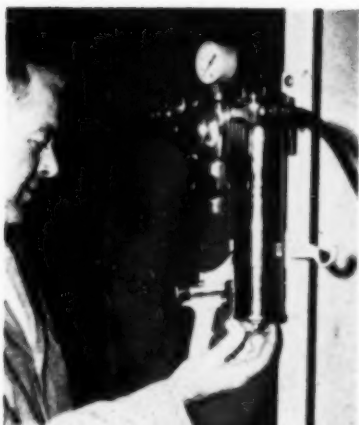
**K-7** DEVILBISS COMPANY, 300 Phillips Ave., Toledo 1, Ohio, has added to its line of spray painting and allied compressed air equipment and oil and moisture separator for cleaning of compressed air, available with or without a regulating device.

The combination unit, embodying separator and regulator, will regulate pressures up to 135 psi from an

air line carrying pressures up to 250 psi. The unit has a length of 15 inches, is 8½ inches wide when equipped with valves and has a depth of 8½ inches.

The separating unit has a centrifugal type oil and water eliminator which is all metal and does not require replacement or maintenance. The filter is a permanent type which has long life and is easily removed for cleaning. The filter chamber is drained by a simple valve at the bottom of the unit. The oil and moisture





Separator with pressure regulation equipment sells for \$41; separator alone for \$23.

separator can be installed in air lines supplying pneumatic tools or other units requiring clean compressed air for operation.

### Spray Gun Powered By CO<sub>2</sub> Cartridges

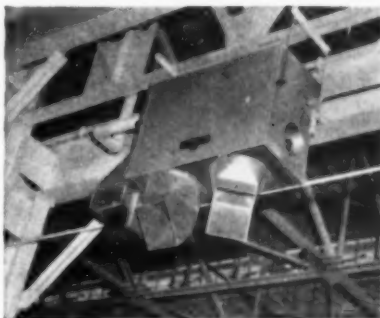
**K-8** SULLIVAN-BECKER COMPANY, Kenosha, Wis., is offering a new, completely portable, pressure type spray gun.

Powered by safe, low-cost, CO<sub>2</sub> cartridges, the Becker "53" spray gun operates with trigger-fast action. It is easy to fill and easy to re-load. Its 21 ounce container is made of heavy gauge steel and the spraying head is cast aluminum. Inserts are made of brass and stainless steel. The spray gun can also be ordered with a special attachment that fits into the handle so that the unit can be pressurized by a conventional air line for the spraying of solutions which will atomize at low operation pressure (approximately 120 psi).



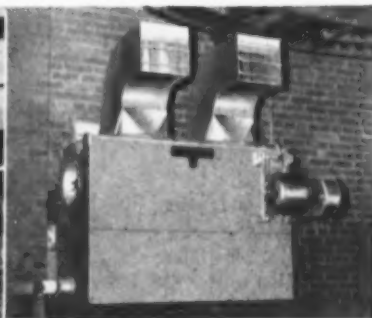
# HEAT-VENTILATE

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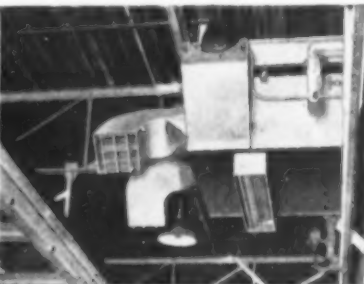
### FRESH, CLEAN WARM AIR

(or cool outside air) is delivered by a compact "Buffalo" Highboy Unit with fresh air filtered intake thru side wall. Bearing bowl at left permits easy external lubrication.



### LOW OVERHEAD — HIGH EFFICIENCY!

Wall-mounted Lowboys provide plenty of heat even where quarters are cramped. New coil design increases heating surface, with narrower coil section. Coils are non-freeze.



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accurately—a "Buffalo" efficiency feature. Others are "Buffalo" mixed-flow fans with unusually stable performance — standardized parts — lifetime construction.

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to heat and ventilate your plant. Bulletin 3704-A gives all details on the units to handle your heating — ventilating — makeup air problem. Handy chart gives you air diffusion distances for each unit and capacity up to 35,000 cfm.



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FORCED DRAFT  
VENTILATING  
EXHAUSTING

## Conveyor Belt Cleaning

**K-9** FULLER BRUSH COMPANY, Industrial Division, Hartford 2, Conn., has developed "Fullergript" cylinder brushes for use in conveyor belt cleaning.

These cylinder brushes are driven by a power take-off arrangement from the conveyor belt itself. A counter shaft, mounted across the conveyor supports, is chain-driven at one end by the head pulley, while the other end is connected by chain drive to the brush.

The frame supporting the brush is suspended from the counter-shaft in a manner resembling a Ferris wheel chair, with the brush at the front and adjustable counterweights in the rear. Brush pressure against the conveyor belt is controlled by moving these counterweights. Brush speed is varied by changing the diameter of any four pulleys.

The Fullergript brushes are made in standard conveyor widths with a variety of core and shaft sizes and fill materials.

## Equipment . . Supplies . . Methods (Continued)



This drive assembly plan for mounting Fullergript conveyor belt cleaning brushes eliminates the need for a separate power unit by tapping the conveyor head pulley

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## Aluminum Coated Steel Wire

**K-10** PAGE STEEL AND WIRE DIVISION, AMERICAN CHAIN & CABLE COMPANY, INC., Monessen, Pa., announces the availability of aluminum coated steel wire, intended for applications requiring superior resistance to corrosive conditions.

The coating is bonded tightly to its metal base and is so ductile that it can be drawn to any desired thickness. Based on coatings of equal thickness to that of zinc, resistance to weathering in industrial atmospheres is expected to be 2 to 20 times as long.

## Taper-Lock Sprockets

**K-11** DODGE MANUFACTURING CORPORATION, Mishawaka, Indiana, announces extension of the "off-the-shelf" line of Taper-Lock sprockets to include the 1½ in., 1¾ in. and 2 in. pitch sizes.

This means that users of single strand roller chain will now be able to secure sprockets and bushings for chain sizes from 40 through 160.

ready for immediate installation without delay for re boring, keyseating, drilling and tapping.

Taper-Lock sprockets are compact, having no flanges nor protruding parts. They occupy no more space on the shaft than ordinary sprockets. Their flush design contributes to safety. They mount on the shaft quickly and easily and hold with the firmness of a shrunk-on fit. And when necessary they can be removed just as simply—they come off easily without shock to bearings or machinery. Bushings may be reused.

### Flexible Control Center

K-12

THE SQUARE D COMPANY, 4041 N. Richards St., Milwaukee 12, Wis., is offering a newly designed control center featuring unusual flexibility.



Removable operator's panel gives flexibility to Square D Company's control center.

A removable operator's panel in the door of each individual combination plug-in unit accommodates up to four push buttons, selector switches, or pilot lights. This unique construction facilitates the removal of control center units since no wires to pilot devices in the door need be disconnected. It is also easy to install additional pilot devices in the removable panel when field changes become necessary.

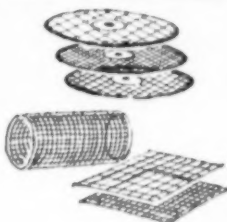
High short circuit strength is obtained by edge-to-edge mounting of horizontal bus bars and by the use of strong tubular vertical bus. Standard control center section dimensions are 20" wide, 20" deep and 90" high; and each section will accommodate up to six combination starter plug-in units.

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**FREE CATALOG** gives full range of wire cloth available, also shows fabrication facilities and includes valuable metallurgical data. Write for your copy today.



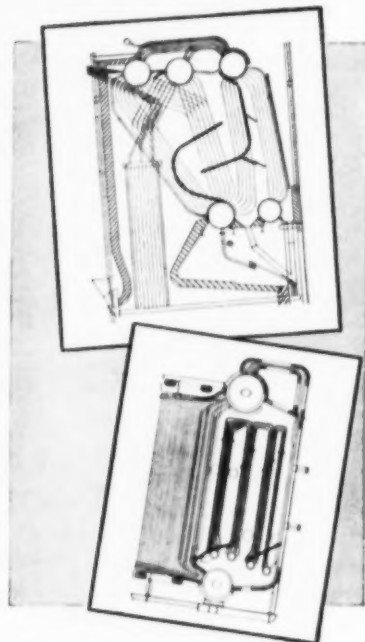
## The Cambridge Wire Cloth Co.



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Cambridge 10,  
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Each application is designed on the basis of more than a quarter century of experience in this specialized branch of power engineering. Installations are made by skilled mechanics.

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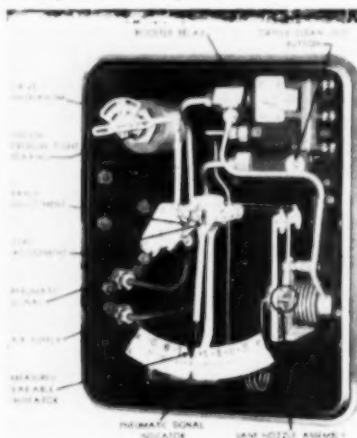
75 WEST STREET, NEW YORK 6, N.Y.

In Canada: Rock Utilities Ltd., 80 Jean Talon St. W., Montreal, P. Q. EC-208

## Equipment . . Supplies . . Methods (Continued)

### Universal Pneumatic Transmitter

**K-13** BAILEY METER COMPANY, 1050 Ivanhoe Road, Cleveland 10, Ohio, announces that pneumatic telemetering and control systems may now be simplified by the use of a new universal unit for transmitting measurements of flow, level, pressure, temperature, draft, differential, and vacuum.



The measuring element actuates the transmitter's micro-sensitive vane, nozzle, and booster assembly. Transmitted signals of 3-15 and 3-27 psig may actuate pneumatic receivers and/or controllers. Both the measured variable and pneumatic signal are indicated on a common scale for easy checking and comparison.

The unit is approximately 8" x 10" x 3 1/4". The casing is weather, vibration and corrosion resistant. Transmitting distances can be 1000 ft to receivers, 400 ft to controllers. Accuracy is within  $\pm 1/2\%$  of measured range span, and air consumption is less than 0.15 cfm. Capacity is approximately 3 cfm with a drop of 1 psig from a signal of 15 psig.

### Water Level Gauge for High Pressure Boilers

**K-14** THE DIAMOND POWER SPECIALTY COMPANY, Lancaster, Ohio, announces a new development for water level indication in high pressure boilers, called the "Multi-Port" gauge.

Principal features are: lower maintenance because of the simplicity

Diamond's Multi-Port Bi-Color gauge for operating pressures up to 3000 psi.

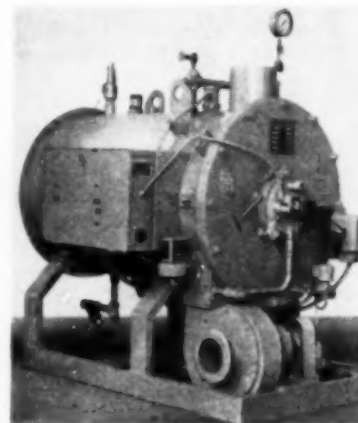


of construction and the rapid and easy replacement of the inexpensive small mica, glass and gasket elements (done without removing gauge from boiler); greater pressure and thermal stability because of design principle using small, round ports. It does not require long warming-up period. It is readily portable since gauge only weighs about 58 lb including flanges. Readability is excellent, as ports stand out as brilliantly colored beacons: green is water and red is steam—water level is always where colors meet.

### "Pocket-Size" Boiler Unit

**K-15** AMES IRON WORKS, INC., Oswego, N. Y., announce a new line of "pocket-size" automatic package boiler units in the low price range.

Called the Model TP Steam Generator, it is available in seven sizes from



Ames' automatic packaged units—seven sizes 15-60 hp; pressures 15-200 lb.



15 to 60 horsepower (15 to 200# W. P.), for firing with light oil, gas or light oil-gas combination.

The small dimensions, lower price and self-contained design answer the demand for an economical, automatic source of steam or hot water for operations requiring smaller capacities. The boiler is fully piped and wired and needs only to be connected to the customer's service lines and to his breeching or stack. The new units provide unusual flexibility for any user of steam, permitting later addition of units should capacity requirements increase.

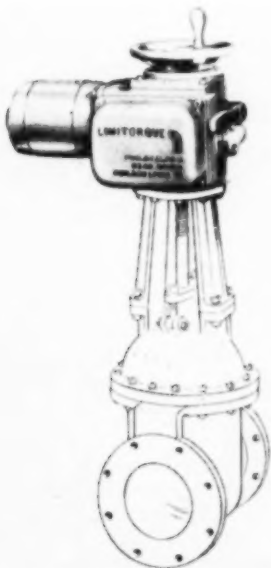
#### Motorized Valve Operators

K-16

PHILADELPHIA GEAR WORKS, Erie Ave. and G St., Philadelphia 34, Pa., is offering a motorized valve operator for small valves.

These new motorized valve operators may be controlled electrically from any conveniently located push-button station. In case of power failure, a handwheel is incorporated in the control unit for manual operation if necessary.

As the name implies, "LimiTorque" limits the amount of torque applied to valve operating parts. Also the amount of torque or stem thrust may be accurately adjusted for varying service conditions through a micrometer, type "torque switch." These LimiTorque Controls offer a new and more economical method of motorizing gate, plug, and butterfly valves.



... designed for small valves ranging from 1½" to 8" port diameters.

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## Equipment . . Supplies . . Methods (Continued)

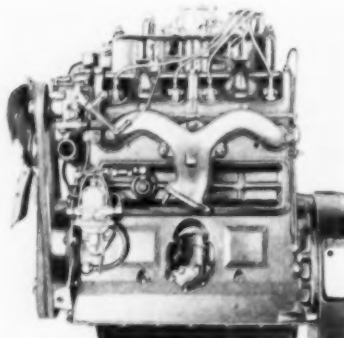
### "F" Head Industrial Engine

**K-17** WILLYS MOTORS, INC., 1380 N. Cove Blvd., Toledo, Ohio, is producing in its new Industrial Engine Department a 4 cylinder "F" head engine based on designs perfected for the military jeep.

The F-head is a combination valve-in-head and valve-in-block construction. This design, therefore, allows maximum valve diameters and increased "breathing" qualities. Because only the intake valves are in the head, there is a rapid, unobstructed flow of fuel to the combustion chamber.

The intake manifold is built integral with the head for water heating to give best possible mixture distribution between cylinders without overheating the charge at high load.

The intake valves are operated by push rods through rocker arms in a conventional manner. Since only the exhaust valves are in the block, there is increased water jacketing to



Willys Motors' Model 4F . . highest ratio of horsepower to cubic inch displacement.

provide better control of heat. These valves are operated by conventional valve tappets.

Bore and stroke of Model 4F is 3 1/8" x 4 3/8" and the total piston displacement is 134.2 cu in. Its maximum brake horsepower at 2400 rpm is 51 hp, and at 4000 rpm in 70

hp. At the same speeds, its maximum torque is correspondingly 111 and 91 ft lb.

### Self-Contained Dispenser For Shop Floor Absorbents

**K-18** OIL-DRI CORPORATION OF AMERICA, 520 N. Michigan Ave., Chicago, Ill., has developed an absorbent dispenser made of solid steel with 150 lb capacity.

Design is rugged and simple. There are no parts to adjust. Its economical operation is based on a slot-type release which automatically drops absorbents to the floor of the dispenser where it can be scooped up in the desired quantity to clean an oil spill.



A screen mounted on the top of the dispenser makes it possible for absorbents to be reused. Pouring sweepings from the floor back through this screen, filters out steel chips, scraps, paper and other foreign materials while the absorbents drop back into the dispenser.

### Liquid Etching Product For Concrete Surfaces

**K-19** RUST-OLEUM CORPORATION, 2799 Oakton St., Evanston, Ill., is offering a liquid etching product for properly preparing concrete and cement floors and masonry surfaces for sealing and re-finishing.

Highlight feature of this Rust-Oleum Surfa-Etch is its unusual safety factor in application. No special clothes, gloves, goggles, or aprons need be worn when applying it. It is fume-free, odor-free, non-inflammable, and will not damage metal surfaces in the room such as electrical conduits and machines.

The product cleans, etches, and neu-

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\*Available but we do not install

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tralizes the concrete or cement surface in one application by cleaning the pores free from oils, greases, dirt and accumulated soap film and neutralizing the alkalies. This is known as the "boiling out" process.

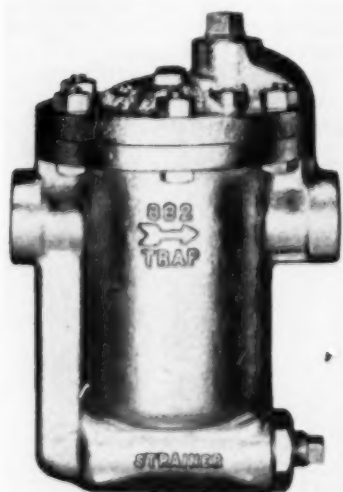
Surfa-Etch should be applied liberally by brush or spray, after first scraping and removing dirt, oil and grease. Then it should be thoroughly scrubbed into the surface for three to five minutes in any given area, with either a scrub brush or electric floor machine. Following this, the surface should be rinsed for three to five minutes with clear, fresh water and allowed to dry thoroughly before application of the sealer. Rust-Oleum Clear-Seal may be used as a dust and water repellent sealer and Rust-Oleum Floor and Deck Coatings as the finish coat.

### Integral Strainer Trap

**K-20** ARMSTRONG MACHINE WORKS, Three Rivers, Michigan, has added to its line of integral strainer steam traps, a new larger model designated as No. 882.

The new trap is said to cost less than a standard trap plus separate Y-type strainer and fewer fittings are required to install it.

A stainless steel strainer screen is located in the body casting at the bottom of the trap. The No. 882 has horizontal and opposite pipe connections of 1/2 in. or 3/4 in. size. Maximum operating pressure is 250 psig.



Trap recommended for use where dirt and scale conditions are bad; capacity ranges from 1300 to 2200 lb condensate per hour.

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Since 1913 Dum Dum Masonoc has protected the off-street walls of this famous Mobile, Ala., hotel. For 33 years the original application of this thick, tough skinned coating kept hurricane-driven rains from penetrating . . . ruining interiors. Not until 1946 was it advisable to apply another coat of Masonoc.



**GET THIS LONG-LIFE PROTECTION FOR YOUR BUILDINGS!**



The Dum Dum Masonoc System, an Arco exclusive, is the most durable masonry protection you can buy . . . for grain elevators, industrial and commercial buildings . . . or hotels. Sprayed by approved applicators, Dum Dum Masonoc protects against weather, fumes, acids, alkalis and moisture. Ten times thicker than paint, it expands and contracts, bridges fine cracks . . . has a skin that heals itself . . . reveals if cut or gouged, yet stays pliable underneath.

Dum Dum Masonoc is one of an impressive group of Arco quality coatings that add life and value to your buildings and reduces per-year maintenance cost. Stack Dum Dum, Arcopel Rubberized Masonry Paint, and Arroc Silicone Transparent Water Repellent are also available for specialized maintenance problems.

And remember . . . there are Arco Maintenance Paints for every maintenance need . . . from flagpole to boiler room!



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## More inches of VISIBILITY... and No Blind Spots with NEW Jerguson STEAM GAGES

You get more inches of visibility within centers available... and no blind spots with the New Jerguson Steam Gages with the horizontal expansion loop. The special new compact valve, with a horizontal loop that keeps the strain off the gage assembly under varying conditions of expansion and contraction, gives you maximum gage room within the centers.

The special offset single piece gage chamber design with staggered glasses and covers gives you continuous visibility of the water level with no blind spots between gage sections.

The gage can be turned at any angle, yet there are no stuffing boxes between gage and valves. The ingenious design of the assembly includes a bracket so the gage will always stay in vertical position. The OS&Y valves have renewable seats and are standard with quick closing stem for chain operation, as shown, or available with plain closing stems and chain wheels.

Made in three designs of single piece chamber for one, two, or three section glass for any W.S.P. Any Jerguson standard gage may be supplied with stems and flanges for use with this expansion loop valve.

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Assembly  
No. 618

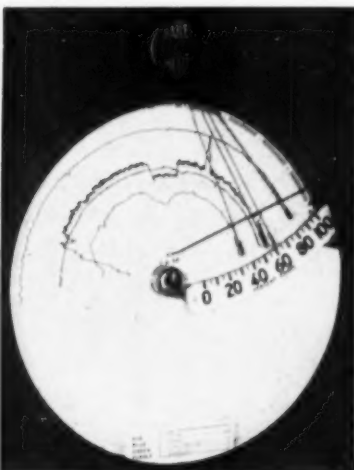
## new equipment (continued)

For more data circle item code number  
on the postage free post card—p. 17

### Receiver Recorder Design

**K-21** BAILEY METER COMPANY, 1050 Ivanhoe Road, Cleveland 10, Ohio, has introduced a new receiver recorder for pneumatic and electric transmission systems in power and process plants.

The recorder keeps continuous, independent records of one to four pneumatic and electric transmissions in any combination. Unique, plug-in, precalibrated receivers make this advancement possible.



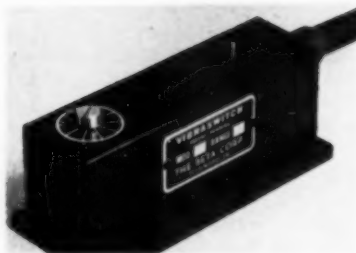
The new Bailey Recorder has plug-in receivers and one-year automatic inking.

Receiver units may be added or interchanged, permitting easy field adaptation to new or revised metering and control applications. Two plug-in escapement-type integrators may be included in the same casing with two flow records.

Fountain-type recording pens provide continuous feed for one year without refilling. The new pens are stainless steel capillary, fed from hermetically-sealed ink sacs. The instrument is designed for panel mounting, requiring a cutout of only 14" x 17".

### Vibration Protective Device

**K-22** THE BETA CORPORATION, P. O. Box 8625, Richmond 26, Va., has introduced the new "Model 1 Vibraswitch", designed for vibration measurement or as a protective device permanently install-



Protection, measurement, warning and automatic shut-down with Beta Corporation's Vibraswitch.

ed on any rotating or vibrating machine.

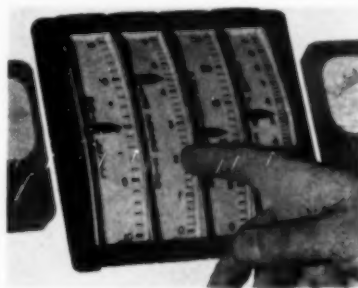
The instrument serves to prevent costly damage or material wastage from malfunctions causing or resulting from excess vibration. An internal snap switch may be wired into control circuits carrying up to 5 amperes to actuate a warning or shut down the machine the instant the vibration exceeds normal by a preselected amount.

The device is capable of actuation with vibratory displacement increases of less than 10 microinches at the most sensitive setting. Flat frequency response from 0 to 200 cps., (12,000 rpm.) insures reliable results on high speed equipment. The "Vibraswitch" requires no power source or special auxiliary equipment.

### Miniature Remote Indicator

**K-23** THE HAYS CORPORATION, Michigan City, Ind., is producing a miniature remote indicator which has a 5" scale, designed for easy reading.

The instrument features removable units; easy "one man" zero adjustment; no parallax; internal illumination; and flush or semi-flush panel mountings.



The indicator can be supplied as an electric or pneumatic receiver for the measurement of any function such as pressure, draft, flow, level or



temperature. The pneumatic type gage uses as its actuating element a spring-loaded metallic bellows with built-in overpressure protection.

The gages can be provided with two units in a single case and two pointers on the single scale. A direct reading gage, using a bourdon tube as the actuating element, is available for indicating pressures of fluids.

The electric model uses as its operating mechanism a specially designed motor, electronic amplifier, and a pair of differential transformers (one at the transmitter, the other at the indicator) forming an electric null balance circuit. Transmitters for pressure, draft, temperature, flow and level are offered.

### Machinery Leveling Mounts

**K-24** THE BARRY CORPORATION, Watertown, Mass., has introduced a new, larger Leveling Barrymount which carries up to 10,000 lb per mount.

The new LM7 allows heavy machinery to be installed and levelled in a matter of minutes, without bolting or shims. Other features of these machinery mounts include: low installation and maintenance costs (up to 90% less time to install than the bolting method, and elimination of the constant tightening of lag bolts); less wear and tear on adjacent machinery and on the plant structure itself; better accuracy; better working conditions, less noise; and no more "floor walking" of heavy machines (isolators absorb all modes of vibration—horizontal, vertical, and rotational).



Capacity per mount up to 10,000 lb . . bolts are adjusted with a hand wrench until all four magazines are at the proper height

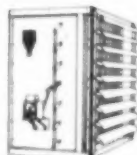


Is this the way your plant gets its **MAKE-UP AIR** ?

IF SO,  
YOU NEED

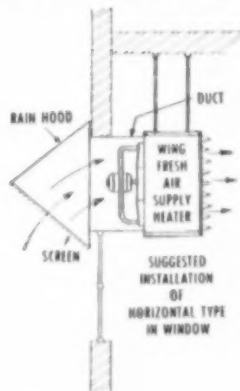
## WING FRESH AIR SUPPLY HEATERS

WHEN air is exhausted from paint spray booths or other plant operations, it must be replaced. If no other means are employed, it rushes back through opened doors or windows, or seeps back through cracks and crevices. Your exhaust fans can't work properly or efficiently and your heating system is nullified. WING FRESH AIR SUPPLY HEATERS are the answer. They supply make-up air properly heated, they require no expensive duct work and the coils cannot freeze, regardless of weather, because full steam pressure is on at all times.



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WING FRESH AIR  
SUPPLY HEATER

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UNIT HEATERS



FANS



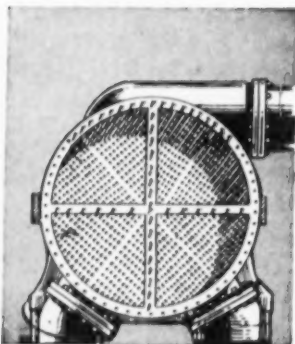
SEVENTY-FIVE YEARS AGO  
Demonstrating the new Edison phonograph. This simple hand-cranked machine, invented in 1877, was soon to be in every home, doing for sound what the invention of printing had done for literature. In 1879, L. J. Wing, another talented inventor of that period, was designing and building fans, steam engines and electric motors, which won many awards for the L. J. Wing Mfg. Co., today celebrating its 75th anniversary.

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## News for the South and Southwest (continued)

(Starts page 8)

### Lion Oil Dry Ice Plant, La.

By employing the Girbotol process for purifying raw ammonia synthesis gas, the LION OIL COMPANY will have a stream of high purity carbon dioxide available as a by-product at its new Barton plant, located on the west bank of the Mississippi River in St. Charles Parish, LOUISIANA. A portion of the stream will be used in producing dry ice and liquid carbon dioxide.

The dry ice plant is being engineered and erected by THE GIRDLER COMPANY, LOUISVILLE, KY., a division of the National Cylinder Gas Company, Chicago.

### Glidden Building New Baltimore Plant

One of the largest titanium dioxide and sulphuric acid plants in the world will be constructed by the GLIDDEN COMPANY on a 100-acre site in BALTIMORE.

Plans call for construction to begin immediately on the first unit of the huge plant, which alone will cost \$10,000,000 and cover some 25 acres. Completion of this portion of the plant is scheduled for December of 1955. Ultimately, three units will occupy the 100-acre site. Titanium dioxide, an extremely durable white pigment, is derived from ilmenite ore. It is used extensively in the manufacture of paints, wallpaper, linoleum, plastics, synthetic film, welding electrodes, lithographic metal coatings and many other industrial products.

Because of its use in production of titanium dioxide, sulphuric acid will be manufactured at the new plant. A portion of the first unit will be a sulphuric acid recovery plant.

G. M. Halsey, director of manufacturing for the Glidden Company's Chemicals, Pigments and Metals Division, will be in complete charge of planning and construction of the new facilities. Design and construction activities will be directed from offices in downtown Baltimore.

Some 15 buildings will comprise the first unit of Glidden's new titanium dioxide and sulphuric acid plant. Included will be offices, laboratories, power plants and production facilities. Construction is to be of brick, reinforced concrete and steel.

### Superintendent of Power Bryan, Texas

CALVIN W. BEARD, a native of Brazos county and graduate of Texas A&M College, has been employed as superintendent of the Bryan Municipal Steam Power plant to fill the vacancy created by the recent resignation of M. A. True.

His activities will be confined solely to the superintendency of the steam power plant, which is undergoing an expansion program.

Mr. Beard received a degree in mechanical engineering from Texas A&M in 1933. He spent three years there also studying electrical engineering, and is a licensed professional engineer.

Prior to his connection with the Texas City refinery, where he was responsible for operation, maintenance and betterment of all utilities service, he worked with the operation of a steam electric power plant of 228,000 KW capacity at the Manhattan Project, Oak Ridge, Tennessee.

### Nordberg Mfg.—Dallas

Appointment of MARVIN WALL as District Manager of the Heavy Machinery Division and R. C. "Dick" GAMBLE as Sales Engineer, Dallas Territory, has been announced by the NORDBERG MANUFACTURING COMPANY, Milwaukee 1, Wis.

Wall is promoted to the District Managership succeeding C. B. Trimble, recently retired. He assumes the responsibility for serving Nordberg customers and prospective users in Oklahoma, New Mexico, and North and Central Texas.

Marvin Wall is a native of Texas and a veteran of almost 20 years in the Diesel engine business. He started his career with the Cooper-Bessemer Corporation in 1935, where he progressed from the Parts Department to Manager of that department, and to Sales Engineer in the Southwestern States. In 1949 Wall joined Nordberg to serve as Sales Engineer in the Dallas Territory until his recent appointment.

Gamble is a Milwaukeean schooled in Milwaukee Public Schools and Marquette University and the University of Wisconsin. During World War II

he served as a U.S.A.F. Fighter Pilot in the European theatre. Upon return to civilian life he went to work for Cleaver-Brooks Company and in 1948 joined the Nordberg organization. Gamble will assist in field engineering and the sales of Nordberg's extensive line of heavy duty engines ranging up to 10,800 hp.

#### **American Viscose—Virginia**

DONALD S. PORTER, EDWARD F. DILLON and MARVIN P. LONG will receive promotions and reassignment of duties in the Filatex Division at the Roanoke, Virginia, plant of AMERICAN VISCOSE CORPORATION, Gerald S. Tompkins, Vice President, announced. Expanded production facilities and development of special types of rubber threads require streamlining of the organization to permit specialization of the members of the present staff. The plan of reorganization is effective immediately.

Mr. Porter is to be Chief Chemist of the Filatex Division responsible for chemical control in the production of rubber thread and allied products. Mr. Long will be Production Superintendent, responsible for the manufacture of rubber thread and covered rubber yarns. Mr. Dillon will be assigned as Mr. Long's assistant.

#### **U. S. Steel—St. Louis**

A new warehouse for distribution of aluminum mill products has been opened at 311 S. Sarah St., ST. LOUIS, MISSOURI, by U. S. Steel Division of UNITED STATES STEEL CORPORATION. The new facility will serve as a distribution center for REYNOLDS ALUMINUM mill products in the St. Louis area, and in Memphis, Evansville, Kansas City, Tulsa, Oklahoma City, Little Rock and Wichita.

#### **Lewis-Shepard—Texas**

LEWIS-SHEPARD PRODUCTS, INC., Watertown, Mass., has announced the appointments of two new exclusive sales representatives in Texas. CAY M. JENSEN will represent Lewis-Shepard in the DALLAS-Ft. WORTH area with offices at 5507 Longview Street, Dallas. THE ROGER BROWN COMPANY will represent Lewis-Shepard in EL PASO with offices at 608 Montana, in El Paso. Both representatives have complete sales and service facilities.

### **News (continued)**

#### **Bailey Meter Names Krusemark Dallas Resident Engineer**

F. D. KRUSEMARK of BAILEY METER COMPANY, Cleveland, Ohio, has been appointed a Resident Engineer with headquarters at 6331 Aberdeen Ave., DALLAS 30, TEXAS.

A sub-division of the Houston district office, the Dallas territory includes northern Texas and northwestern Louisiana.

Krusemark, who was graduated from the University of Colorado with a Bachelor of Science degree in mechanical engineering, joined the company in 1946.

#### **VEPCO Elects Smith and Will**

THE VIRGINIA ELECTRIC AND POWER COMPANY recently elected M. C. SMITH executive vice president and ERWIN H. WILL vice-president and general manager of the company.

Mr. Smith fills the vacancy created by the recent retirement of Mr. W. E. Wood, and Mr. Will takes over the position formerly held by Mr. Smith.

Mr. Smith entered the public utility field in 1912 and after extensive service in Nova Scotia was transferred to BATON ROUGE, LA., in 1926 as president of the Baton Rouge Electric Company. From 1931 to 1936 he was president of the El Paso Electric Company in EL PASO, TEXAS, leaving there to become vice-president of Vepco in RICHMOND, VA. He was elected vice-president and general manager of Vepco in 1950.

A native of Richmond, Mr. Will was graduated from Virginia Polytechnic Institute in 1922 and accepted employment with the Virginia Railway and Power Company (now Vepco) in the Engineering department at Richmond. Later he was transferred to Norfolk in charge of Engineering and subsequently became assistant superintendent of the Electric department there. In 1928, he was promoted to manager at Suffolk.

Mr. Will left Vepco in 1935 to join the El Paso Electric Company and rose to become its president and a member of its board of directors. He returned to Vepco in 1947 as general manager of operations and in 1950 was elected vice-president—operations. He is now serving as the president of the Public Utilities Association of the Virginias.

#### **Power Show—Dec. 2-7**

Exhibitors at 21ST NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING at Philadelphia will include, in addition to many newcomers, a number of companies returning after absences from recent events.

The scheduled dates, Thursday, Friday, and Saturday, December 2, 3, and 4; and Monday and Tuesday, December 6 and 7, were arranged during the period of the seventy-fourth annual meeting of the American Society of Mechanical Engineers, under whose auspices the exposition will again be held.

Exhibits already located in the exposition comprise the entire field of power plant engineering and associated mechanical apparatus. There will be displays by producers and fabricators of raw materials in great variety; boilers and steam generators; gas and oil burners; auxiliaries representing every avenue of economy in the production of steam for processing, as well as for power purposes. The range includes a long list of mechanical and electrical drives and transmissions, material handling equipment of every description, piping, valves and controls.

Instrumentation will reach new peaks of interest for visitors through the latest developments in automation.

As heretofore, the exposition will be under the management of the International Exposition Company, with headquarters at 480 Lexington Avenue, New York. E. K. Stevens is the exposition manager.

#### **G-E Names Lilly—Ala.**

Appointment of CLYDE A. LILLY, ATLANTA, as Sales Manager of the BIRMINGHAM office of the GENERAL ELECTRIC COMPANY's Apparatus Sales Division was announced recently by Milton M. Collins, Apparatus Manager for Alabama.

Lilly, who started with G-E in 1945, as a test engineer for the Philadelphia Works, has received both the Gold Key and the Manager's Award for his outstanding work on precision gears. For the past two and a half years, he has served as a Turbine Specialist in the Atlanta G-E office. A graduate of A. and M. College of Texas with a BS degree in mechanical engineering, he is a member of the Georgia Engineering Society and the American Society of Mechanical Engineers.

*Announcing*

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Everywhere today we hear from industrial men about the ever-lowering profit margin and the need for more efficient production methods . . . decreasing costs . . . minimizing waste . . . increasing profits . . . the need, in short, for a well-rounded, smoothly-functioning maintenance program which insures better productivity.

That's why companies are searching for more efficient maintenance methods and materials. If they are to sustain even a minimum profit level, many of them must step up maintenance and improve procedures.

## A BETTER-MAINTENANCE "MUST"

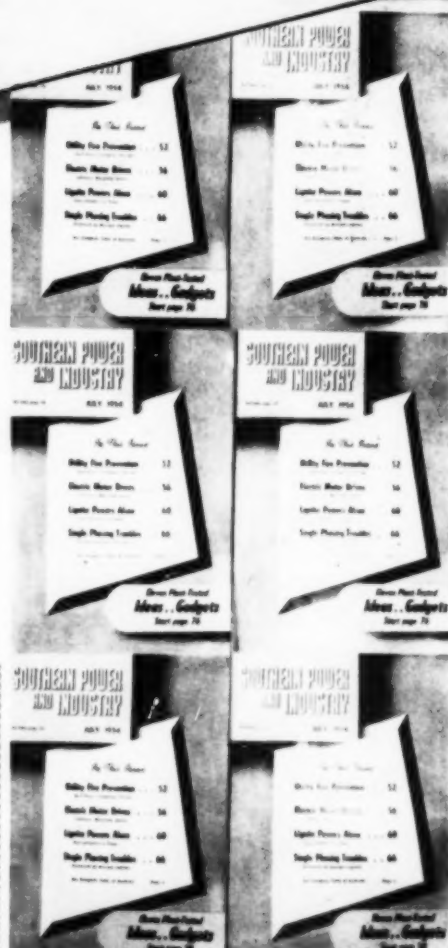
Engineers in Southern industrial, power, and large service plants will find answers to many of their maintenance problems in "Plant Maintenance", the great new book just released by S.P.I. Composed of nearly a hundred selected articles on plant maintenance—reprinted from recent issues of SOUTHERN POWER AND INDUSTRY—"Plant Maintenance" presents in concise, convenient, and readable form a wealth of up-to-the-minute, time-saving tips to the engineers responsible for plant up-keep in Southern and Southwestern industrial organizations.

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### A-C Southern Appointments

The assignment of four sales representatives to district offices of ALLIS-CHALMERS general machinery division in the Southern area has been announced.

The men and their new posts are as follows: ROBERT H. PRITCHARD, JR., ATLANTA; JOSEPH D. VINCENT, MEMPHIS; WARREN F. SPANUTUS, SAN ANTONIO, and JAMES R. MILLS, BEAUMONT. All entered Allis-Chalmers employ in 1952 and recently completed the company's training course for graduate engineers.

### Rusco Names Hinson—Ala.

THE RUSSELL MANUFACTURING COMPANY, Middletown, Conn., recently appointed ALEX T. HINSON as belting sales representative for the South Central States. Mr. Hinson, a native of Alabama, has been with the company since 1931. His territory comprises OKLAHOMA, TEXAS, ARKANSAS, LOUISIANA, MISSISSIPPI, western TENNESSEE, part of FLORIDA, and ALABAMA, where he has his headquarters.

### Eclipse Plastic—Florida

E. G. ENGMAN, President and General Manager, ECLIPSE PLASTIC INDUSTRIES, INC., has announced the opening of the company's new 15,000 sq ft plant near OSPREY, FLORIDA. The plant will initially concentrate production on plastic pipe in a range of  $\frac{1}{2}$ " to 4", and will produce a complete line of tubes, rods, and films.

### Trane—Oklahoma City

THE TRANE COMPANY, manufacturing engineers of air conditioning, heating, ventilating and heat transfer equipment, announce that BANKS W. CLARK has been appointed manager of the OKLAHOMA CITY sales office, 1710 North Broadway.

### New OG&E Power Station Scheduled for Muskogee

THE OKLAHOMA GAS & ELECTRIC COMPANY has announced that it will begin construction of a new generating station at Muskogee capable of producing 170,000 kw of electricity.

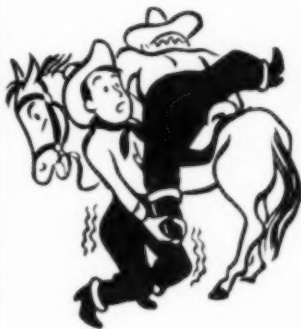
The power plant, which will be located on the east bank of the Arkansas River, adjacent to the company's Riverbank generating station, will house a single 170,000 kw generator, which will be the largest ever brought into the State of Oklahoma. Estimated cost of construction is \$21,000,000, including substation facilities.

### Universal Controls—Dallas

GEORGE BEESE has joined UNIVERSAL CONTROLS CORPORATION of DALLAS, TEXAS, in the executive capacity of plant manager, in charge of all production and purchasing.

Mr. Beese comes to Universal from C. A. Dunham Co., Chicago, where he served as assistant to the president in charge of production and engineering. As a production engineer he has been associated with Fisher Governor Company, Delman Corp., Wood Bros., and during the war served as Iowa State Director of the War Production Board.

Universal Controls Corp. in Dallas produces gas pressure regulators, insulation or dielectric pipe unions, and the new Dragnet Leak Detector.



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## WHAT'S NEW and Where to Get It

FOR FREE INFORMATION—Circle code number on page 17 or 18

**V-1 EXHAUST FANS**—Catalog No. 500-B—Features the S-2 Exhaust Fan, describes various applications, types and construction. Complete dimensional data and capacity tables to assist in selection. Engineering data for standard and long-cone Cyclone Separators included.—FORT WORTH STEEL & MACHINERY CO., Box 1638, Fort Worth 1, Texas.

**V-2 ALUMINUM JACKETING**—Folder No. J-25, 4 pages—Contains complete application instructions for Childers Jacketing for weather-proofing of insulated lines, towers, vessels, and tanks. Illustrated with detailed drawings.—CHILDERS MANUFACTURING CO., Box 7447, Houston 8, Texas.

**V-3 COOLING TOWERS**—Bulletin "Econ-O Water-Saver," 2 pages—Lists principal features of natural draft cooling towers for industrial and other uses. Gives specifications. Engineering data includes tables of dimensions and capacities. Illustrated.—ENGINEERED PRODUCTS CO., 524 Locust St., Gadsden, Alabama.

**V-4 INDUSTRIAL TRAPS**—Bulletin No. 800, 12 pages—Illustrates and describes the "Unitrap," an all purpose, universal steam trap for pressure ratings of 6 to 250 lb. Covers design, construction, operation, and other pertinent information. Includes steam pipe selection chart. PERFECTION SERVICE CO., 332 Atanda Ave., Charlotte, N. C.

**V-5 VIBRATION CONTROL**—Bulletin 500-1, 4 pages—The "Vibra-switch," a control device for monitoring or measurement of vibration caused by any type of malfunction, is described. Applications, vibration range, adjustment and acceleration measurement, are discussed. Specifications are given.—THE BETA CORPORATION, Box 8625, Richmond 26, Va.

**V-6 CORROSION CONTROL**—Booklet, 26 pages—"Corrosion Control of Electric Light and Power Structures and Equipment" is designed to give field operating men of electric light and power companies practical painting information on all phases of transmission and distribution work. Illustrated with application photographs.—SUNBOX, INC., Fairmount Plant, Hackensack, N. J.

**V-7 MASONRY PAINT**—Catalog Page—Describes "Arcopel," a rubberized masonry paint of unusual toughness and high alkali resistance, for use on exterior surfaces or uncoated interior walls. Includes specifications and application directions, and a color chart with samples of the nine colors and white available.—THE ARCO COMPANY, 7391 Bessemer Ave., Cleveland 27, Ohio.

**V-8 ROD AND SHAFT PACKINGS**—Bulletin A-131, 8 pages—Describes Garlock's patented "Lattice Braid" rod and shaft packings; discusses construction features; materials available; sizes; forms. Includes service reports from users in various industries.—THE GARLOCK PACKING COMPANY, Palmira, N. Y.

**V-9 GROUTING METHOD**—Form E-16, 16 pages—Describes grouting of heavy equipment with Embeon non-shrink mortar. Tells what the material is; discusses mixing and placing of grout; cold and hot weather grouting; and includes estimate tables and application illustrations.—THE MASTER BUILDERS CO., 7016 Euclid Ave., Cleveland 3, Ohio.

**V-10 ELECTRIC MOTOR CONTROLS**—Catalog No. 161, 146 pages—Contains engineering and design data including wiring diagrams. Among the many items listed are magnetic starters and contractors, combination starters, control panels, drum controllers, master, foot and pressure switches. Photographs and prices are included.—FURNAS ELECTRIC COMPANY, 1947 McKee St., Batavia, Ill.

**V-11 SWIVEL JOINTS**—Catalog G-4, 32 pages—Covers complete line of ball-bearing swivel joints and other Chiksan products, including loading racks, manifolding lines, and related equipment. Gives dimensional and operating data. Typical applications are illustrated.—CHIKSAN COMPANY, Brea, Calif.

**V-12 SOLENOID VALVES**—Bulletin A-3, 1 page—Describes and illustrates additions to line of general service solenoid valves, including new models to handle pressures from 1 to 300 psi, and steam to 150 psi, designed to eliminate hammer and shock in automatic or remote control of steam, air, gas or liquid flow.—J. D. GOULD COMPANY, 730 E. Washington St., Indianapolis 2, Ind.

**V-13 GEAR COUPLINGS**—Catalog C-4, 16 pages—Covers advantages, typical applications, standard types, special types, and engineering data on new line of flexible gear couplings having more horsepower with less size and other outstanding features. Illustrated with drawings and plant photographs.—THE SIER BATH GEAR & PUMP COMPANY, INC., 2552 Hudson Blvd., North Bergen, N. J.

**V-14 AUTOMATIC WEIGHING**—Bulletin No. 9459, 6 pages—Guide is designed to help in selection of correct automatic weighing equipment for various materials handled in industrial plants. Gives comprehensive list of materials with suggested scale types for each. Equipment is illustrated.—RICHARDSON SCALE COMPANY, Clifton, N. J.

**V-15 FLUORESCENT PRODUCTS**—"Fluorescent Guide," 24 pages—Discusses planned group replacement of fluorescent lamps, gives answers to 11 questions on fluorescent lighting; application photographs; other pertinent data, including complete catalog information on fluorescent products for commercial and industrial users.—SYLVANIA ELECTRIC PRODUCTS, INC., 1740 Broadway, New York 19, N. Y.

**V-16 METAL CUTTING**—Catalog Form 1153, 6 pages—Shows multiple blade and single cut hole saws in a wide range of sizes for metals and wood. Lists hole sizes, iron pipe-conduit sizes, pipe tap sizes, tool and blade specifications, and prices.—MISENER MFG. CO., INC., 292-8 Walton St., Syracuse 2, N. Y.

**V-17 INDUSTRIAL LUBRICANTS**—Catalog, 22 pages—Describes line of Albany greases, oils, and specialties for use in bearings, chain drives, conveyors, gears, grease cups, hoists, hydraulic equipment, pneumatic tools, and other industrial equipment. Discusses properties and applications. Illustrated.—ADAM COOK'S SONS, INC., London, N. J.

**V-18 SPEED REDUCERS**—Bulletin 3169, 28 pages—Contains information for the selection of any type (horizontal, vertical or right angle) "Motoreducer" in all motor or integral type. Illustrations show practical application in various industries.—THE FALK CORPORATION, 2901 W. Canal St., Milwaukee 8, Wis.

**V-19 COLLOIDAL DISPERSIONS**—Bulletin No. 460, 10 pages—Tells how "dag" colloidal dispersions serve industry. Lists 40 basic dispersions of graphite, molybdenum disulfide, vermiculite, and zinc oxide, in carriers such as water, oil, volatile hydrocarbons, resin solutions, alcohol, glycol and wax emulsions.—ACHESON COLLOIDS COMPANY, Division of Acheson Industries, Inc., Port Huron, Mich.

**V-20 FUSE REDUCERS**—Bulletin No. 8, 2 pages—Illustrates and describes Trico line of fuse reducers designed to be attached to each end of the fuse before it is installed. Advantages and construction features are covered, and catalog information on sizes, capacities, and weights is given.—TRICO FUSE MFG. CO., North 5th at W. Chambers, Milwaukee 12, Wis.

**V-21 RUST REMOVAL**—"Rustgon" Bulletin, 4 pages—Describes a new, non-acid rust removing material that simultaneously strips paint, rust and primer from ferrous metal surfaces in two simple steps—a dip and a pressure rinse. Covers applications in various industries.—TURCO PRODUCTS, INC., 6135 South Central Ave., Los Angeles 1, Calif.

**V-22 FLY ASH COLLECTOR**—Bulletin, 6 pages—Describes a regenerative fly ash collector for all plant arrangements and sizes, based on a unique aerodynamic principle. Illustrated with installation photographs and cutaway views. Flow diagram shows performance data.—BRESLOVE SEPARATOR COMPANY, Commonwealth Bldg., Pittsburgh 22, Pa.

**V-23 GAS COMPRESSOR**—Bulletin 75, 22 pages—Describes the new GMVA angle type gas compressor unit, featuring greater air flow, higher horsepower, and lower fuel consumption. Photographs and drawings show cross sections of design, and plant application is shown.—THE COOPER-BEESSEMER CORP., Mount Vernon, Ohio.

## \$\$\$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

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Atlanta 5, Georgia

**V-24 VIBRATION CONTROL**—Bulletins PS-1, 2, 3, and 4, 2 pages each—"Here's How" series of sheets showing actual installation photographs of outstanding vibration control applications in several industrial fields, including punch press and shear; machine tool; air conditioning; diesel and gas engine.—THE KOPFUND CO., INC. 48-15 Thirty-second Place, Long Island City 1, N. Y.

**V-25 INTEGRAL SEAT VALVES**—Bulletin 531, 4 pages—Describes a 30 minute service operation for welded bonnet, integral seat valves that does not require removal of valves from the line. Photographs illustrate procedure.—EDWARD VALVES, INC., 1201 W. 143rd St., East Chicago, Ind.

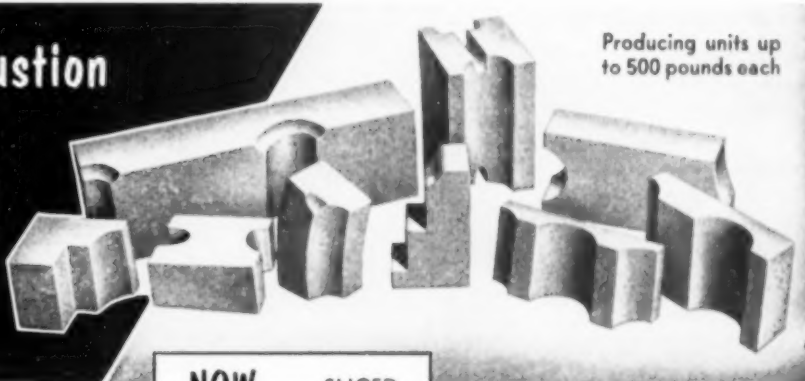
**V-26 MAINTENANCE CLEANING**—Describes chemical cleaning service for such applications as refineries, paper mills, steel mills, utilities, chemical plants and many other industrial operations. Illustrated.—POWELL INCORPORATED, P. O. Box 536, Tulsa 1, Okla.

**V-27 MAINTENANCE COATINGS**—Catalog, 8 pages—Describes coatings for new construction and general maintenance, where it is desirable to kill rust on steel; prevent undercutting by rust on adjoining exposed steel; create an alkaline surface condition which prevents corrosion.—TNEDEC COMPANY, INC., 125 West 23rd Ave., North Kansas City 16, Mo.

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**V-29 THERMOSTATIC TRAPS**—Bulletin 11-52, 2 pages—Illustrates and describes Sterling Type No. 72 and 73 thermostatic traps for industrial applications. Tables give capacity in pounds per hour, and dimensions for these bronze construction traps for pressures of 0 to 200 lb. Lifting and pumping machines and regular steam separating traps are also covered.—STERLING ENGINEERING AND MANUFACTURING CORPORATION, 117 Business St., Hyde Park, Boston, Mass.

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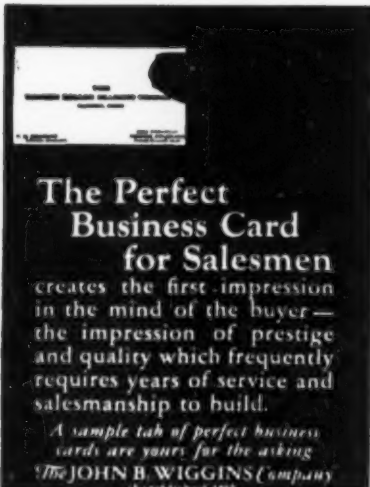
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### Bibliographic Survey of Corrosion

PUBLISHED BY NATIONAL ASSOCIATION  
OF CORROSION ENGINEERS  
1061 M & M Building, Houston 2,  
Texas  
346 pages  
Price, \$10.00 NACE Members; \$12.50  
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Summaries of 3512 corrosion and corrosion prevention articles, books and brochures published in 1948-1949 are compiled in this volume. Literature is divided into eight main groups in the NACE system: general, testing, characteristic corrosion phenomena, corrosive environment, preventive measures, materials of construction, equipment and industries.

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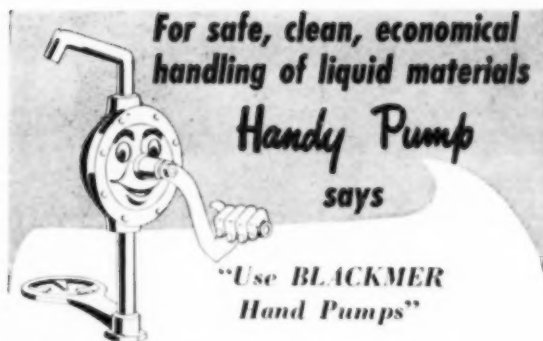
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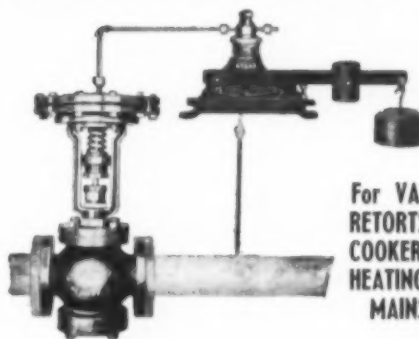
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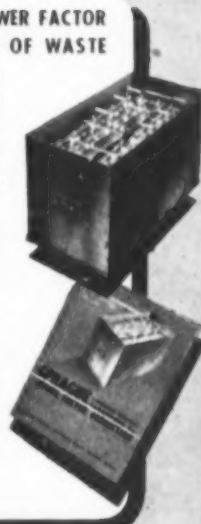
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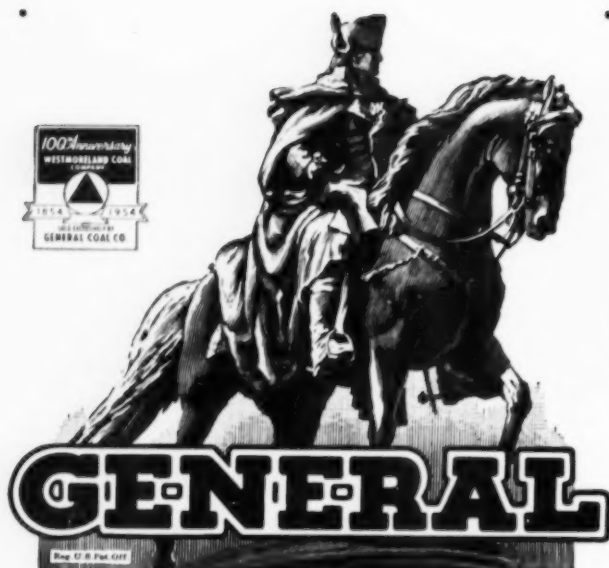
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*Hennepin Power Station, Illinois Power Company. Steam Capacity 525,000 lb/hr. Consulting Engineers: Sargent & Lundy*



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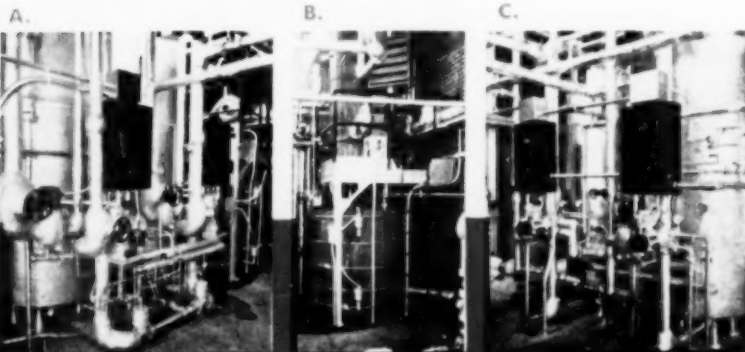
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